



Agricultural Theme Study for Central Texas

Historical Studies Branch, Environmental Affairs Division

TEXAS DEPARTMENT OF TRANSPORTATION

Environmental Affairs Division, Historical Studies Branch

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Agricultural Theme Study For Central Texas

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AGRICULTURAL THEME STUDY FOR CENTRAL TEXAS

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SECTION 1. INTRODUCTION

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This report provides guidelines for identifying, documenting, and evaluating the National Register of Historic Places (NRHP) eligibility of agricultural properties within Central Texas. An agricultural property, as defined in this report, is a tract of land with historic-age resources and associated fields and pastures that historically supported any type of agriculture-related activities. This definition accounts for a broad and diverse range of properties such as farms to grow cotton, corn, or other crops; ranches to raise livestock such as cattle, sheep, and goats; and dairy farms used to produce dairy products. Although each subtype within the agricultural property grouping has its own unique and distinct physical and associative qualities, they all directly support the kinds of agricultural activities that have taken place in the region since the Spanish established their first permanent settlements and continue to do so to the present.

The study area (*Figure 1-1*) encompasses the following 13 counties in Central Texas: Bastrop, Bell, Bexar, Caldwell, Comal, Coryell, Falls, Guadalupe, Hays, McLennan, Milam, Travis, and Williamson. This geographic area extends over a diverse territory where a wide range of agricultural activities have occurred since Europeans first settled in the region in the eighteenth century. The topography, water sources, and soil types are among the many characteristics that influenced agricultural patterns and activities. The resulting cultural landscape presents a cross-section of agricultural patterns, buildings, and demographics that extend over a much broader area outside of Central Texas. The procedures and guidelines described in this report can be used and applied for proposed transportation projects and other federal undertakings for a significant geographic area within Texas.

This report underscores the dynamic quality of agriculture in the region. In contrast to many other parts of the country where agricultural patterns often have maintained remarkable consistency over time, agriculture in Central Texas features greater diversity and constant shifts in trends and activities stemming from unpredictable weather and precipitation patterns, fluctuating market forces, innovations in agriculture techniques and practices, and the effects of government policies related to agriculture and related activities. As a result, agricultural properties in the region often present a more layered history and landscape that often makes it difficult to classify a property simply as a farm or ranch. A particular location may reflect physical attributes and characteristics that reflect a variety of agricultural activities. For example, the rolling prairies east of present-day Interstate Highway (IH) 35 initially were used to raise cattle during the early settlement era. In later years, the area attracted a large number of farmers who grew cotton, especially during the late nineteenth and early twentieth centuries when demands for cotton increased and its cultivation was profitable. By the second quarter of the twentieth century, however, over-farming, soil depletion, and drops in cotton prices led many agriculturalists in the region to abandon some or all of their tilled cotton fields and use them for grazing. This and other regional trends are reflected in the associated cultural landscape and often demonstrate the resourcefulness and adaptability of the residents. While the dynamic quality of agriculture in the region often makes the process of assessing significance and integrity assessments for NRHP eligibility more complex, this attribute is a key and vital aspect of the history of the region. This quality is, in fact, significant in its own right and must be considered with the framework of NRHP eligibility assessments.

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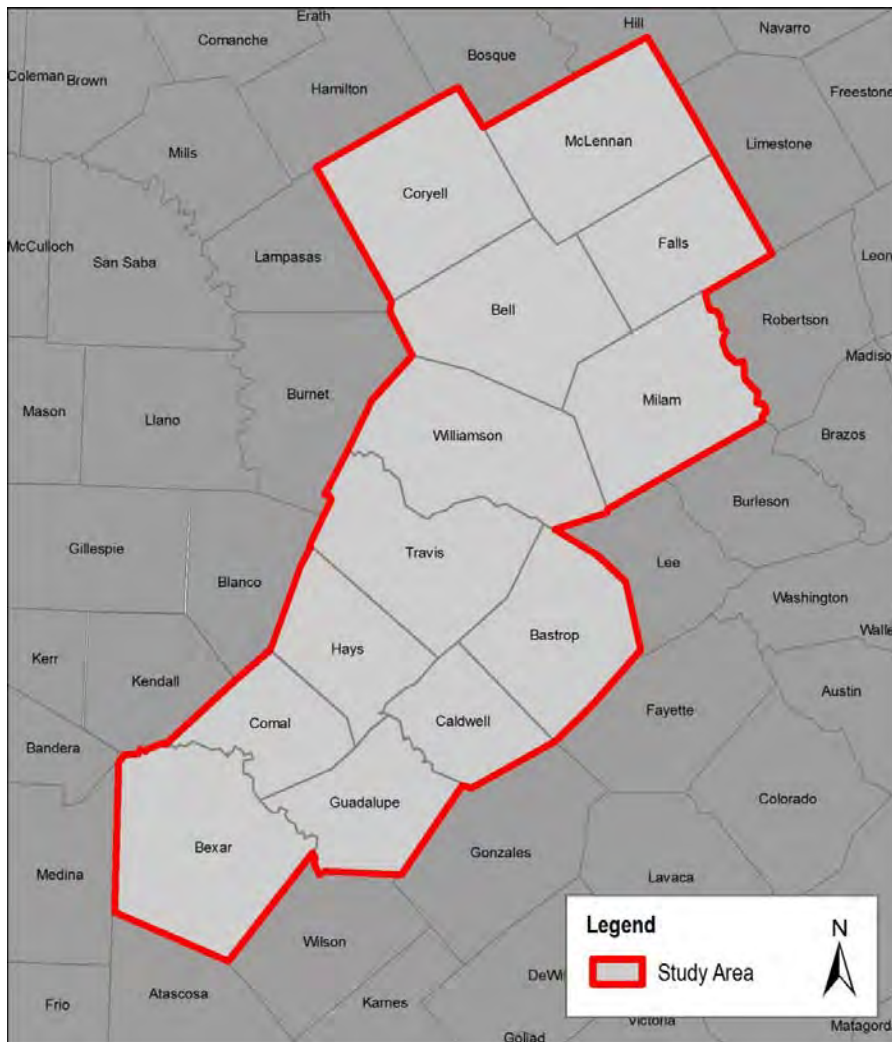


Figure 1-1. Study Area map.

The guide was prepared in support of a Memorandum of Agreement (MOA) developed and signed by the Texas Department of Transportation (TxDOT), the State Historic Preservation Officer (SHPO), Federal Highway Administration (FHWA), Advisory Council of Historic Preservation (ACHP), and the Williamson County Historical Commission (WCHC) as mitigation for an adverse effect to a historic property (Bryson Farmstead) impacted by the construction of 183A Toll Road in Williamson County. The MOA stipulated that TxDOT undertake specified mitigative actions to offset the adverse effect to the Bryson Farmstead, which was determined to be eligible for inclusion in the NRHP. TxDOT subsequently modified its entire identification and review process to avoid adverse effects for future transportation undertakings. This guide is a key part of these new policies and describes in detail procedures to identify, document, and evaluate agricultural resources in Central Texas. Although these guidelines specifically focus on Williamson County and the surrounding area, the steps and procedures described in the report can be applied to agricultural properties in other parts of the state.

Although the guidelines are part of mitigative measures implemented for the 183A Toll Road MOA, they also will be important as a planning and management tool for TxDOT and other future transportation

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projects that may affect historic agricultural properties. The need for such a document stems from the explosive growth that much of Central Texas is experiencing which is prompting an expanded and improved transportation infrastructure. Increased residential and commercial development and a massive influx of residents to the region is creating a burden on an already strained transportation network. As the region's population centers expand and residential and commercial developments intrude into surrounding areas, many rural landscapes are subject to a great deal of development that transforms their historic physical character, integrity, and associative qualities. TxDOT is adopting a proactive approach to gather information regarding agricultural properties in a systematic fashion and will ask that consultants use these guidelines to gather more complete information and conduct more thorough documentation and analysis to consider potential impacts to historic agricultural properties. Finally, this report encourages historians to regard agricultural properties in a more holistic fashion that not only considers the individual buildings and structures on such a property, but also spatial relationships among the buildings and the associated lands. The steps described in this document rely on the National Park Service's Bulletin 30, *Guidelines for Evaluating and Documenting Rural Historic Landscapes*.

These guidelines are extensive and provide a great deal of information regarding the identification, documentation, and evaluation of agricultural properties in the region. Because of the complexity of the subject material and TxDOT's desire to have an instructive and informative manual to help historians better understand agricultural properties, the report is very detailed. However, the report has been prepared so that each section can be a stand-alone document. The organizational presentation allows for historians to refer to select chapters for use in the field or as is needed.

The report begins with **Section 1: Introduction**, which describes the impetus for the guidelines and describes the organization and presentation of materials.

Section 2: Research Guide and Methodology, facilitates an understanding of agricultural properties and landscapes in Central Texas by introducing researchers to primary and secondary sources in seven major repositories and 11 online sources. The Research Guide provides detailed information about each repository, identifies useful sources, and suggest the ways consultants can use the sources as they conduct fieldwork, context and property type development, and NRHP evaluations. The Research Guide also includes an annotated bibliography of secondary sources about agriculture in the 13-county study area and information about the use of legal records.

Section 3: Fieldwork Guide and Methodology, provides step-by-step instructions for completing field surveys of agricultural properties in Texas. It outlines the methodological approach to identifying and documenting agricultural properties by completing specific pre-fieldwork, fieldwork, and post-fieldwork tasks. This chapter also provides the methodological approach to completing fieldwork on properties where right-of-entry (ROE) is denied or not obtained. The Fieldwork Guide explains how field investigations relate to other aspects of completing a historic resources survey in a rural setting, and should be used in conjunction with other chapters included in the Agricultural Theme Study for Central Texas.

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Section 4: “A Context for Understanding the History of Agriculture in Central Texas, 1700-Current”

provides a tool for understanding the history of agriculture in the study area within the broader contexts of agriculture in the United States and Texas. Three additional contexts focus on major agricultural activities in the 13-county study area—farming, ranching, and dairying—identify developmental periods, and link agricultural activities with national and state trends. The three specific contexts also describe themes, events, and historical patterns that have influenced the physical evolution of farms, ranches, and dairies as agricultural types.

Section 5: Property Type Development, discusses the built environment of agricultural properties in Central Texas by outlining the three main areas or “zones” of agricultural properties and providing descriptions and photographic examples of common resource types found within each zone. The zones (called the domestic work zone, agricultural work zone, and fields/pastures) are characterized by the types of resources and their functions, and the activities performed therein. This section discusses each work zone type; provides aerial photographs depicting the zones within farms, dairy farms, and ranches; and describes and illustrates, through photographic examples, the common resource types found within each zone. This chapter will help historians survey, identify, and document individual resources on agricultural properties and understand how each resource fits into the large cultural landscape of the property.

Section 6: Evaluation Methods, provides step-by-step instructions for applying the National Register Criteria for Evaluation and the Seven Aspects of Integrity to assess the NRHP eligibility of agricultural properties in Central Texas. These guidelines are intended to assure a more consistent approach for evaluating significance and integrity to National Park Service standards. The guidelines define the many steps involved with the process of conducting such assessments and encourages that the process be conducted in a thoughtful and deliberative manner. Furthermore, the evaluation methods directs the historian to consider not only the historical associations and physical attributes of the buildings, structures, and objects commonly found on a historic agricultural properties, but also take into account the spatial relationships and associative qualities that exist between these resources and associated land that supported agricultural activities.

Section 7: Case Studies, takes information from three historic resources survey reports completed independent of this report and explains how the guidelines presented in earlier sections of this study of agriculture in Central Texas can be used and applied in real-life situations. The first case study summarizes a reconnaissance-level survey completed for a road-widening project in rural Travis County and describes the process of identifying and evaluating a historic agricultural property within the APE. The remaining case study examples concentrate primarily on the application of evaluation methods developed for intensive-level investigations of previously identified agricultural properties. While one example examines a parcel where the owner granted permission to access the property in Caldwell County, the other showcases an agricultural property in Williamson County where the owner denied right-of-entry. In the Williamson County example, the guidelines describe indirect methods that a historian can use to learn more about the history and physical development of an agricultural property. The three case studies represent the most likely scenarios historians will encounter while identifying, recording, and evaluating historic agricultural properties for a transportation undertaking.

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Section 8: Cartographic Data and GIS Guide, provides a summary of commonly used cartographic materials, including maps and aerial photographs, in Texas. This section outlines the collections and repositories where various maps can be obtained and how the maps can be used for historic resources surveys and property-specific research of agricultural properties. Section 8 also presents an overview of GIS mapping capabilities, along with guidance on how GIS analysis can be used in a beneficial way in historic resources surveys.

The guide was completed over a multi-year period under multiple work authorizations that TxDOT, Environmental Affairs Division, Historical Studies Branch (ENV-HIST) issued to HHM. This report was prepared by a highly qualified team of historians with extensive experience studying, documenting, and evaluating historic agricultural properties in Central Texas. Primary authors of the report include David Moore (HHM), Martha Freeman (free-lance historian), and Maryellen Russo (Blanton & Associates) with important contributions from Alexis Reynolds, also of Blanton & Associates. The authors wish to thank Bruce Jensen and the entire TxDOT ENV-HIST staff for their support, suggestions, and feedback throughout the development of these guidelines. Specifically, Renee Benn, who served as Project Manager for ENV-HIST, deserves special acknowledgement for her invaluable insights, comments, and contributions for the duration of the project.

SECTION 2. RESEARCH GUIDE AND METHODOLOGY

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SECTION 2. RESEARCH GUIDE AND METHODOLOGY

INTRODUCTION

This deliverable, a Research Guide, is intended to facilitate an understanding of agricultural properties and landscapes in a Central Texas study area by directing researchers to useful primary, secondary, and online sources. The Guide identifies key primary, secondary, and online sources. It is meant to complement and support the fieldwork, property type development, NRHP evaluation, and historic context tasks that appear elsewhere in the *Agricultural Theme Study for Central Texas*.

The study area that is the focus of the Research Guide is comprised of 13 counties: Bastrop, Bell, Bexar, Caldwell, Comal, Coryell, Falls, Guadalupe, Hays, McLennan, Milam, Travis, and Williamson. The Guide identifies repositories that contain collections that are relevant to the study area and provides information about the scope and character of historical resource types that can be found in each repository. The Guide lists and analyzes online sources that are both broadly and specifically helpful to researchers interested in agricultural history, technology, architecture, and related subjects. It also discusses historic contexts completed in states other than Texas that focus on agricultural property types.

The audience for the guide is TxDOT Section 106 consultants, who come to projects sponsored by the Environmental Affairs Division, Historical Studies Branch with a wide variety of professional backgrounds. Consequently, one purpose of the Guide is to assist consultants by identifying sources about a range of topics that are related to agriculture, including Texas agricultural history, climate, soils, vegetation, regional and national economies, technology, ethnic settlement patterns, transportation networks, and urban development. The Guide is not intended to be an exhaustive listing. Instead, it points the way to potentially useful collections, identifies helpful record types, and suggests how consultants might use the information to identify, understand, explain, and assess the significance of agricultural properties and landscapes. Because the Guide is not exhaustive, researchers are encouraged to seek out similar repositories in Central Texas that may include collections similar to those described in this document.

The Research Guide includes five chapters, a table, and three appendices. Chapter 1 describes seven repositories that hold primary source materials. Chapter 2 identifies and describes 16 selected primary source types and explains what each type offers researchers, the assets and limitations of each, how they can be used in reconnaissance- and intensive-level surveys, and where they are located. Chapter 3 identifies 11 online sources, describes them, and analyzes their usefulness. Chapter 4 discusses six non-Texas historic contexts. Chapter 5 discusses the mechanics of research useful to reconnaissance- and intensive-level surveys.

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Appendix A: Repository and Collections Information identifies and provides detailed information about each of the seven repositories discussed in Chapter 1. This information includes locations of the collections, hours, and contact information. *Appendix B: Annotated Bibliography* includes secondary sources available at the repositories and organizes them in five categories: general agricultural history and related topics, county histories, cultural resource management and context studies, soil surveys, and theses and dissertations. *Appendix C: How to Use Legal Records* guides the researcher through the process of using legal records in order to compile a chain of title. *Table 2-1* summarizes the information in Chapters 1-4.

CHAPTER 1: REPOSITORIES AND ASSOCIATED PRIMARY SOURCE MATERIALS

Chapter 1 describes the following seven repositories and the associated primary source materials. More detailed information about each repository appears in *Appendix A* (Repository and Collections Information), *Appendix B* (Annotated Bibliography), and *Appendix C* (How to Use Legal Records).

- Texas Collection, Baylor University
- Texas A&M University Libraries
- Dolph Briscoe Center for American History, The University of Texas at Austin
- Texas State Library and Archives Commission
- Texas Department of Agriculture
- Texas Historical Commission
- County Courthouses

TEXAS COLLECTION, BAYLOR UNIVERSITY

The Texas Collection serves as the archive for Baylor University (*Figure 2-1*). It focuses on the political, economic, and social history of Waco and Central Texas specifically, and Texas in general. The Collection has two main divisions:

► Library Division

The Library Division of The Texas Collection houses books, periodicals, vertical files, Texas State Library and Archives Commission depository documents (county records), microforms, and audiovisual materials. Materials in the Library Division may be searched online by using Bear Cat.

► Archives Division

The Archives Division houses primary source materials. These include manuscripts, tapes and transcripts, photographs, picture postcards, maps, archived new film, and newspapers in original format among which are special, commemorative, and historical editions.



Figure 2-1. The Texas Collection at Baylor University holds numerous primary and secondary sources helpful to historians seeking information about agriculture in Central Texas.

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Texas Collection, Baylor University – Finding Aids

Two online finding aids assist researchers to identify Archives Division materials that are pertinent to the history of agriculture in Texas:

- Archival Finding Aid: The Aid (*Figure 2-2*) is organized alphabetically by the name of the individual collection. The finding aid includes information about the time periods covered by materials within the collection, biographical details about individuals or families associated with the records, and a general description of the kinds of materials within the collection. A box and folder level inventory guides the researcher through the collection.

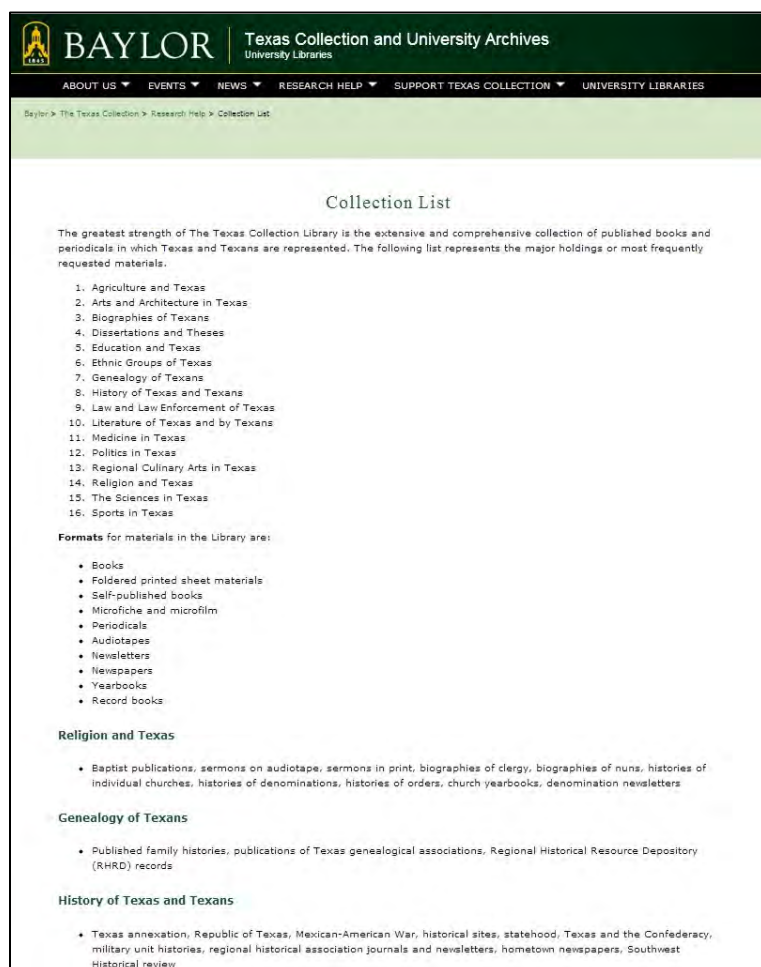


Figure 2-2. The Texas Collection archival finding aid helps direct the researcher to collections that might include information about Central Texas agricultural history.

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Figure 2-3. The oral history holdings inventory lists numerous oral histories that include first-hand information about all aspects of agriculture in Central Texas.

- Oral History Holdings Inventory: The Texas Collection includes more than 3,600 oral history tapes or transcripts produced by the Baylor University Institute for Oral History; more than 760 completed memoirs are available for use (Figure 2-3). Audio and video playback equipment is available in a media resource room. The collection also houses oral histories produced by non-Baylor affiliated individuals dating as early as the 1950s. An example of such tapes is the recollections of a trail hand on the Chisholm Trail.

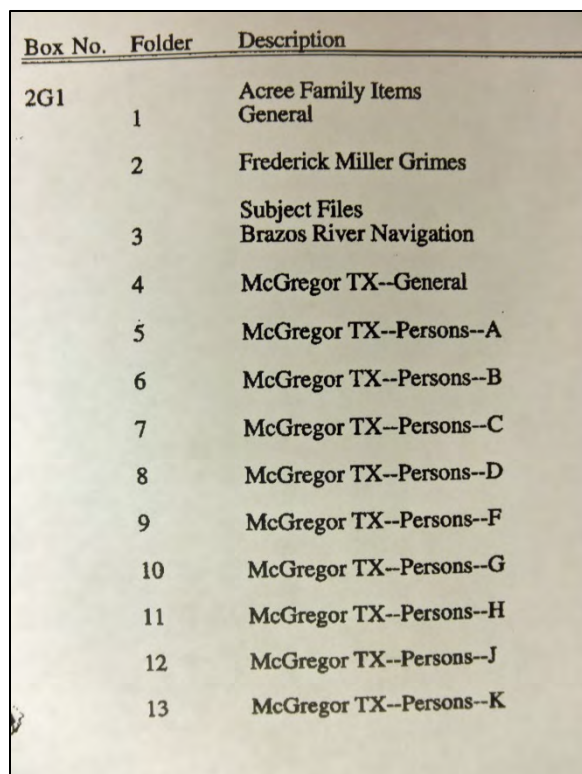
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Texas Collection, Baylor University – Collections

Collections held by the Archives Division that have materials pertinent to agricultural studies include the following:

Fred Acree Papers (1794-1941)

The Acree collection (*Figure 2-4*) was assembled by an individual who spent his life on the Blackland Prairie as a merchant, real estate investor, and farmer. He focused his agricultural activities on growing improved varieties of pecans.



Box No.	Folder	Description
2G1	1	Acree Family Items General
	2	Frederick Miller Grimes
	3	Subject Files Brazos River Navigation
	4	McGregor TX--General
	5	McGregor TX--Persons--A
	6	McGregor TX--Persons--B
	7	McGregor TX--Persons--C
	8	McGregor TX--Persons--D
	9	McGregor TX--Persons--F
	10	McGregor TX--Persons--G
	11	McGregor TX--Persons--H
	12	McGregor TX--Persons--J
	13	McGregor TX--Persons--K

Figure 2-4. The Acree Papers finding aid provides detailed information about the contents of the collection by box and folder number. Other papers pertinent to Acree's agricultural activities are held by the Dolph Briscoe Center for American History at The University of Texas at Austin.

Gladys Allen Papers (1882-1950)

The Allen collection focuses on an individual who was involved in public education. The collection also includes two notebooks kept by A. L. Allen in which he recorded entries on agricultural activities and climatological conditions in Central Texas from 1882-1886 and 1892-1895.

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Matthew Dawson Anderson Papers

The collection (*Figure 2-5*) focuses on the activities of the Anderson family who immigrated to Guadalupe County by 1860 and operated a plantation called Forest Hill on York Creek in northeastern Guadalupe County. Correspondence is filled with agricultural details about the running of the plantation.

Matthew Dawson Anderson Papers #0448		1
Descriptive Summary:		
Creator:	Matthew Dawson Anderson, Harriet Anderson	
Title:	Matthew Dawson Anderson Papers	
Inclusive Dates:	1848-1936, undated	
Bulk Dates:	1848-1860	
Abstract:	The Matthew Dawson Anderson Papers consist primarily of letters written between Matthew and Harriet Anderson right before the American Civil War. Other papers include financial, literary, and photographic materials.	
Accession #:	0448	
Extent:	0.9 linear feet (2 boxes)	
Language:	Collection is in English.	
Repository:	The Texas Collection, Baylor University, Waco, Texas.	
Biographical Note:		
The Matthew Dawson Anderson Papers include correspondence, financial documents, literary productions, and photographic materials. Letters between Matthew Dawson Anderson and his wife Harriet make up most of the collection.		
Matthew Dawson Anderson was born on 16 November 1807 in Louisa County, Virginia, but later moved to Haywood County, Tennessee. At some point he became married while in Virginia or Tennessee. At some point his first wife died, and he began a long-distance courtship with his cousin, Harriet Ann Anderson, from Virginia. She was 12 years his junior, born on 25 January 1819 in Carolina County, Virginia. They were married in 1849. Matthew traveled to Texas in the 1850s as part of his freight business, and settled in Guadalupe County with his family by 1860.		

Figure 2-5. The Anderson Papers finding aid provides information about the contents of the collection and details aspects of the papers pertinent to development of an agricultural historic context.

Carter-Harrison Family Papers

The collection chronicles the lives of an elite McLennan County family that owned and operated an antebellum plantation about 10 miles south of Waco. Documents record life on the plantation through the Civil War and during the post-bellum period, when freed slaves worked as tenant farmers for the Harrisons and eventually formed the community Harrison Switch.

Caufield Family Papers, 1846-1872

The Caufield papers include correspondence among friends and family members in Alabama and Texas. The letters relate to agricultural and other affairs and provide much information about growing cotton and corn, and raising cattle and sheep. Statistics (prices and yields) and general observations are provided, as well as information about the treatment and sale of slaves.

Ralph Edward Conger Ledgers, 1916-1920, 1922

Conger was a physician in McLennan County and also operated a cattle and farming business that is recorded in six years of ledgers (*Figure 2-6*).

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Cotton Research Congress Collection, 1940

The Cotton Research Congress (*Figure 2-7*) met in Waco in 1940 to study reasons for the decline of cotton production between 1907 and 1940. Focusing on the effects of World War I, the Depression, introduction of synthetic fibers, stimulation of foreign production, and soil deterioration, members presented speeches and recorded statistics.

CONGER (RALPH EDWARD) LEDGERS, 1916-1920, 1922		
Ralph Edward Conger, son of Norman H. and Mary A. Wheeler Conger, was born on 15 October 1862 at Oneida, Illinois. The family moved to Waco in 1870. Conger attended Baylor University and received a medical degree from Tulane University in New Orleans. After completing his internship at St. Mary's Infirmary in Galveston, he went into practice in the China Spring-Valley Mills-Wortham Bend area and became known for his successful treatment of pellagra. He married Margaret Rogers of Iowa in 1900; they were the parents of a son and a daughter. Conger died at China Spring on 1 March 1922 and was interred at the China Spring Cemetery.		
The Conger Ledgers detail the physician's assessment of charges to his patients from 1916 to 1920 and for 1922. The ledgers also provide figures for Conger's cattle and farming business. Loose materials from the ledgers are filed together in one folder of correspondence and financial materials.		
Box No.	Folder	Description
2G138	1	Ledgers 1916
	2	1917
	3	1918
	4	1919
2G139	5	1920
	6	1922
	7	Correspondence and Financial Materials, 1918-1924

Figure 2-6. The Conger Collection finding aid is less detailed than many others, but still reveals sufficient information to suggest the helpfulness of the collection in development of a twentieth-century agricultural context for Central Texas.

COTTON RESEARCH CONGRESS COLLECTION, 1940		
Between 1907 and 1940, several factors—World War I, the depression, introduction of synthetic fibers, stimulation of foreign production, and soil deterioration—contributed to the decline of cotton production in the United States and especially in the South. Concerned by the crisis which the American cotton industry faced, a Cotton Research Congress convened in Waco, Texas, on June 27-29, 1940, to study the major points of the problem: trade, production, processing, and consumption. The Cotton Research Congress Collection consists of mimeographed copies of speeches presented at the congress by the various participants, and statistics on cotton production. The papers' authors did not attempt to solve the problem but to clarify it and to offer alternatives and suggestions for improving the industry.		
Box No.	Folder	Description
2J520	1	Subject Files
		Consumption and Utilization
	2	Consumption and Utilization
	3	Consumption and Utilization
	4	Ginnings
	5	Production and Processing
	6	Production and Processing
	7	Trade

Figure 2-7. The Cotton Research Congress Collection finding aid directs the researcher to data that would assist in assessing the role of cotton cultivation in the Texas economy during the first half of the twentieth century.

George Harvey Randle Ledger, 1878-1883

Randle was a doctor who purchased a farm on the Brazos River 10 miles north of Waco; he moved to Waco in 1869 and established the firm G. H. Randle and Company that engaged extensively in buying and selling cotton. The ledger provides statistical data on cotton and wool production in McLennan County, listing names of persons from whom Randle made purchases; and the amounts, weights, and prices of the two commodities.

Mamie Stewart Diaries, 1902-1910, 1917-1919

The Stewart diaries record the life and activities of a young woman on a farm in rural southwestern McLennan County. Activities focused on cotton growing, cultivation, and harvesting, and the diaries record the ebb and flow of that work.

Fort Hood Oral History Project

Tapes, transcripts, photographs, and other items created and collected by the Fort Hood Oral History Project were deposited in The Texas Collection in 2002. Between 1998 and 2001, historians conducted 42 interviews and recorded more than 82 hours of oral interviews about the pre-1942 histories of ranches, farms, communities, and families within present-day Fort Hood. One outcome of the project was publication of a study (Freeman et al. 2001) (*Figure 2-8*) about the history of settlement in Coryell County that included

characterizations of agricultural life and the development of rural communities. A summary of the study appears in *Appendix B* of this Guide.

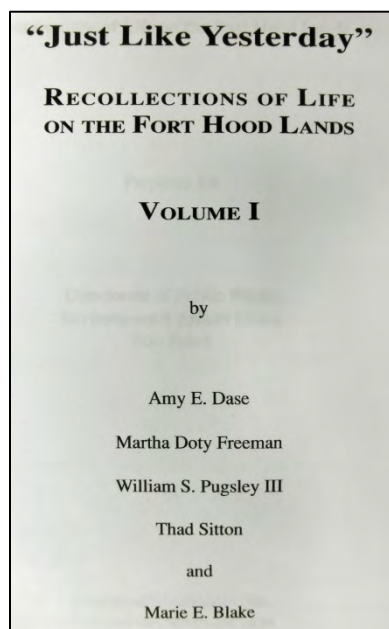


Figure 2-8. Many oral histories remain unpublished. An exception is comprised of the numerous interviews from the vicinity of Fort Hood in Coryell County that were transcribed and published between 1998 and 2003.

Ollie Mae Allison Moen Oral History

This oral history by a member of a sharecropping family describes farmstead layouts and buildings in several locations in the Blackland Prairie region, farming activities such as wheat threshing and cotton raising, crops raised, the dominance of cotton, location of trade centers, and the character of markets.

William C. Wedemeyer Oral History

Wedemeyer's oral history documents a transition from a cotton-centered economy to one characterized by general, diversified farming. He also discusses the impact of the federal tax structure on the appearance of agricultural properties.

TEXAS A&M UNIVERSITY LIBRARIES

The Texas A&M Library system in College Station (*Figure 2-9*) includes two libraries that hold primary and secondary sources pertaining to agricultural history:

Cushing Memorial Library and Archives

Cushing Memorial Library and Archives includes collections that reflect both the nature of the research and teaching missions of Texas A&M University and the range of interests among faculty, staff, students, and friends of the institution. Collection strengths include agricultural history, Western Americana, Texana, natural history, and military history. There are more than 22,000 linear feet of manuscript material, about 173,000 printed volumes, more than 300,000 photographs, and oral history records and transcripts.

The greatest part of the Western Americana and Texana collection, which includes the Jeff Dykes Range Livestock Collection, is comprised of published books, pamphlets, and journals that relate to the cattle, horse, and sheep industries and associated landscapes. Most of those secondary texts are available at other university libraries and archives and are not unique to Texas A&M University.

Because of the legislatively mandated historical focus of Texas A&M on agriculture, agricultural education and training, and service to the broad agricultural community, Cushing Memorial Library and Archives houses archival collections that focus on the history and activities of the Texas Agricultural Extension Service and its predecessor, the United States Cooperative Extension that began in Texas in 1903. Texas A&M joined the Cooperative Extension Service in May 1914, and the Texas Agricultural Extension Service became part of the Texas A&M system the next month. At the core of the Service was the county agent, who worked with local citizens to identify problems; made information about agricultural production, agricultural engineering, and scientific finds available to them; and kept records about agricultural activities on a county level.

Sterling C. Evans Library

The Sterling C. Evans Library is the general academic library for Texas A&M University. The bulk of the library collections and services is located in the Evans Library and Library Annex.

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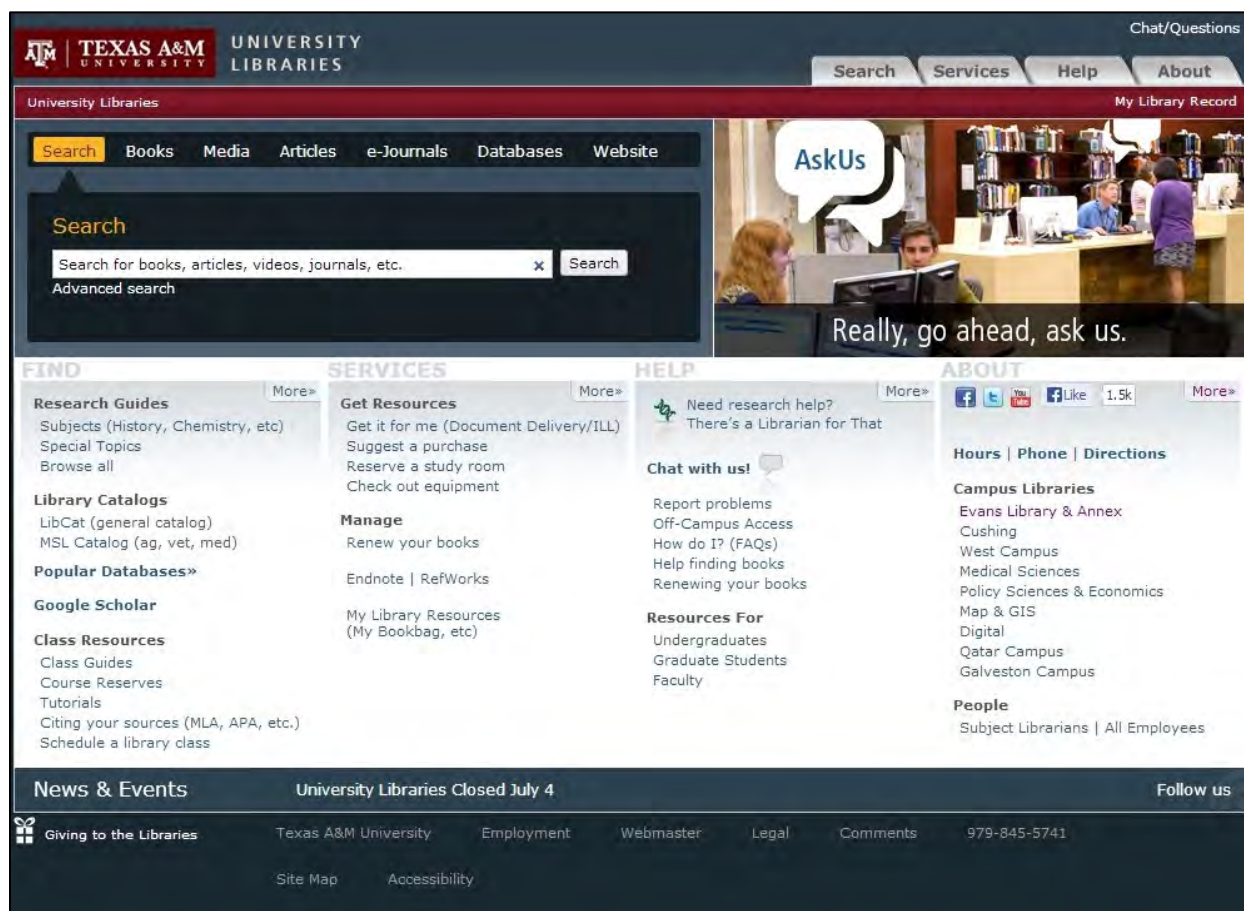


Figure 2-9. The Texas A&M University Library system is a rich source of materials pertaining to all aspects of Texas agricultural history.

CUSHING MEMORIAL LIBRARY AND ARCHIVES, TEXAS A&M UNIVERSITY

Both libraries house published books, periodicals, bulletins, leaflets, and miscellaneous publications, many of which pertain to agriculture. Microfilm holdings at the library include 118 reels of film that replicate holdings at the Dolph Briscoe Center for American History pertaining to agricultural history.

Digital resources compiled by staff of the Evans Library and relevant to this study constitute a digital library called Texas FARMER (Full-text Agriculture Resource Materials Electronic Repository) that documents and preserves agriculture-related resources. In 2010, volumes from Texas FARMER also became part of the HathiTrust, a partnership of academic and research libraries. A sample of secondary sources such as general agricultural studies, bulletins, leaflets, and miscellaneous publications that are available on the Texas FARMER website as well as non-digitized items that are part of the Sterling C. Evans Library holdings are included in *Appendix B*.

Digitized, online photography collections, such as the Cushing Images of a Rural Past also are discussed in Chapter 3 of this report.

Cushing Memorial Library and Archives – Collections

Archival collections in the Cushing Memorial Library and Archives that are associated with the activities of the Texas Agricultural Extension Service include:

Texas Agricultural Extension Service Historical Files, 1914-1970

The Extension Service Files record the activities of the Extension Service from 1914-1970. They are located in 23 record boxes and include biographical information about important agents, scrapbooks, transcribed interviews, African-American extension activities from 1918-1948, and special programs. A finding aid (*Figure 2-10*) provides box-level information about the contents. Records pertinent to the current study include reports about Texas demonstration work, information about the first county home demonstration agent (a resident of Milam County), and histories of home demonstration work as it pertained to landscaping and home life. Other potentially relevant files pertain to soil conservation projects, farm terracing, cotton production and associated cooperative warehousing and banking issues, livestock, and dairying. Files focusing on land use and county planning between 1937 and 1940 exist for Bastrop, Caldwell, Coryell, Guadalupe, Hill, and McLennan counties. Photographs of home and field gardens exist for Bell, Bexar, and Travis counties.

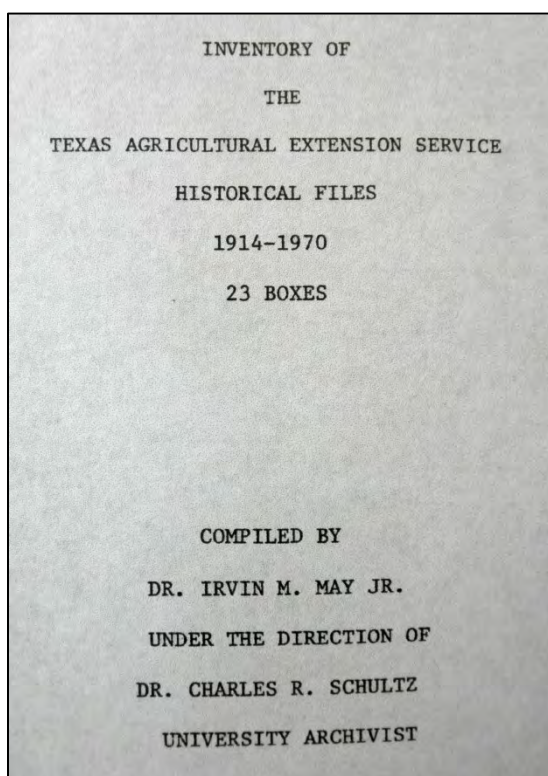


Figure 2-10. The finding aid for the Extension Service provides information on a box level and so is more general and requires more time to search.

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A document in Box 11, file 16 of the files showed that property-specific data had been generated by property owners and collected by county agents. Individual agriculturalists who participated in demonstration projects kept an account form in which they recorded day-to-day activities. They had maps of their properties on which they recorded subdivisions of the property and agricultural data within each subdivision. In the case of ranchers, they recorded numbers of acres, amounts of rainfall, presence of improved grasses, areas of prickly pear eradication, drainages, and locations of cultural features such as windmills, salt boxes, roads, and headquarters. They also provided statistics on numbers and types of livestock, distance to water, crop acres, fences, and equipment. Inserts in the county agent annual reports suggested that such data gathering was wide-spread in Texas. Some amount of that material is available in the Annual Reports of the Texas Agricultural Extension Service, which is described in this document.

Historical Archives of the Texas Agricultural Extension Service

The Historical Archives collection contains 132 boxes of historical records of the Extension Service from 1914-2000. The collection is only what has survived from once more-extensive files of the Service. Topics covered in the files pertain to agriculture, community development, extension programs, and home demonstration. A finding aid describes box contents on a folder level and enumerates agricultural reports by district with newsletters and programs from counties. Other folders, organized in alphabetical order, focus on a myriad of agricultural topics such as building plans, corn production, cotton, dairying, hay, poultry, sheep and goats, and soil conservation.

Microfilm File of Annual Reports, Texas Agricultural Extension Service

Texas A&M microfilmed the county agent monthly reports for all counties in Texas that had active agents. The collection contains 353 reels of microfilm that hold the annual reports of the extension agents for 1909-1966. The microfilm is supposed to be organized by year and then alphabetically by county. Because the records are monthly reports for specific counties, and because the counties in the project area were among the earliest to have county agents, it is likely that the Annual Reports collection is rich in detail and the most likely to include Extension Service project-level information. The 1930 narrative report for Bastrop County, for example, includes reports about terracing; poultry and beef raising; dairying; activities associated with home gardens and raising fruit, truck, and pecans; and the conditions of pastures. Several of the reports identify individual land owners who participated in activities such as terracing. The document also includes a narrative report of extension work in the county and provides some individual homemaker information.

The 1930 narrative report for Bell County (*Figure 2-11*) includes information about the cotton crop and cotton standardization, detailed information about agricultural engineering activities that focuses on terracing and irrigation, dairying, and work to introduce more hogs to the county. The home demonstration report includes information about landscape work and about

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the participation of businesses such as the William Cameron Lumber Company in assisting farm women in making improvements to their homes.

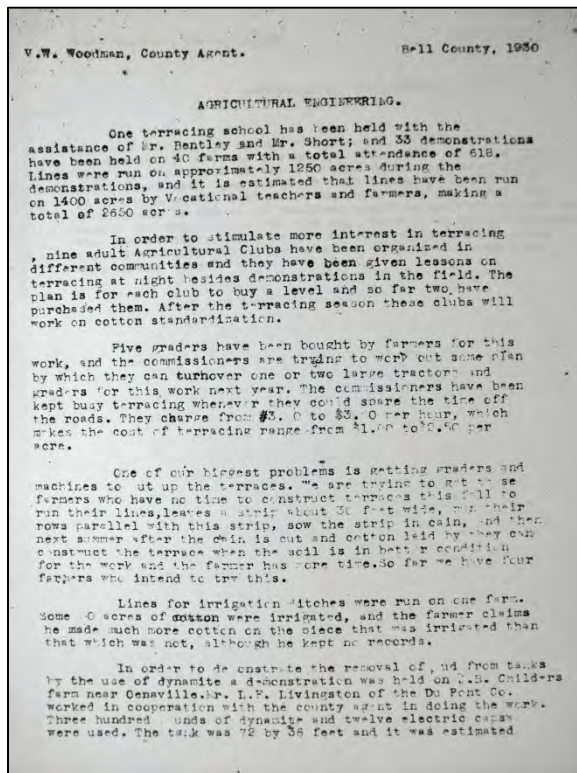


Figure 2-11. In 1930, County Agent V. W. Woodman filed his report about activities in Bell County and included information about the status of the county extension organization, project activities and results, a summary of activities and accomplishments, and a work plan for 1931.

Oral Histories

Cushing Memorial Library and Archives houses almost 700 oral history recordings, 130 of which pertain to agricultural history. They were collected between 1974 and 1980 by Irvin May, Research Historian for the Texas Agricultural Experiment Station (TAES), for the purpose of enriching existing records of the station and expanding knowledge of agricultural history in Texas. Assisted by the former director of the TAES, R. D. Lewis, May conducted interviews with experts throughout the state. All of them have been transcribed and are open to the public. A typical interview was with Fred R. Brison, Professor of Horticulture at Texas A&M University, who provided information about the history of the pecan industry and associated topics.

DOLPH BRISCOE CENTER FOR AMERICAN HISTORY, THE UNIVERSITY OF TEXAS AT AUSTIN

The Dolph Briscoe Center for American History (CAH) (*Figure 2-12*) includes numerous collections that focus on a wide variety of topics. Formats in which materials appear include archives and manuscripts, scrapbooks, photographs, and vertical files. Secondary sources (newspapers, periodicals, theses and dissertations, and books about a variety of agricultural topics as well as about county history) are listed in *Appendix B*.



Figure 2-12. The Dolph Briscoe Center for American History holds numerous collections in a variety of formats that are helpful for development of historic contexts and cultural resource surveys focusing on Central Texas agriculture.

Archives and Manuscripts Collections

The Archives and Manuscripts Collections encompass numerous topics pertaining to the general and specific history of agriculture in Texas from the Spanish Colonial period through the late twentieth century. They include materials that document the broad history of agriculture and the history of agriculture in Texas and on regional, county, local, site- or property-specific levels. They also document companies, organizations, and individuals who were involved in the industry. As a result, the scope and depth of the holdings preclude description of every

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collection that might be useful to a researcher seeking to learn about agriculture in the study area.

► Photographs

The Photographs Collection consists of 5 million photographs covering a wide range of topics.

► Vertical Files

The Center's Vertical Files are accessed by means of a card catalog that is organized according to biographies and subjects. The contents are housed in file folders that have been used to collect information about specific individuals and topics from a wide variety of sources, including newspaper and magazine articles and general ephemera. Subjects related to the broad category of agriculture include, but are not limited to, soil, land, dairying, farm workers, livestock, Farmers' Alliance, Forests and Forestry, Fruit, Plants, American Agriculture Movement, Agricultural Extension Services, Agricultural Experiment Stations, Agriculture Scrapbook, and Texas Department of Agriculture. Separate folders also exist for Cattle, Cotton, Dairying, Grain (including corn, grain elevators, wheat), and Livestock; they make reference to scrapbooks where those exist. Two examples from the Vertical Files are:

- Dairying

The Dairying vertical file is comprised of newspaper articles, clippings from magazines such as *Texas Commercial News* and trade journals such as *Milk Plant Monthly*, press releases from the Crop and Livestock Reporting Service, and programs from dairy shows dated from the 1920s through 2002. The materials pertain to the dairy industry with focus on milk and cheese production. The geographical distribution is predominantly the eastern half of Texas.

- Grain

The Grain vertical file is comprised of pamphlets, publications by government agencies and universities, press releases from the Crop and Livestock Reporting Service, programs from trade shows and conferences, and newspaper articles. The date range is 1930s-1980s.

► Newspapers

Newspaper and Periodical holdings at the CAH include hundreds of unique titles from throughout the state in both original paper and microfilm formats.

► Periodicals

The Center houses numerous periodicals that pertain to the history and practice of agriculture. Among these are: *Agricultural History*, *Cattlemen*, *DeBow's Review*, *Farm and Ranch*, *Ranch Magazine*, *Sheep and Goat Raiser*, *Southwestern Sheep and Goat Raiser*, *Texas Industry*, and *Western Horseman*.

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Dolph Briscoe Center for American History – Finding Aids

► Archives and Manuscripts Collections

Two finding aids help the researcher identify individual collections that include information about agriculture:

- Subject Index to the Catalogued Collections: The Subject Index (*Figure 2-13*) includes numerous references to agricultural topics in individual collections and directs the researcher to look under at least 14 other subject headings. Such headings include farms and farming (35 collections), individual crops (for example, cotton), (68 collections), cattle and cattle industry (38 collections), livestock and the Texas and Southwestern Cattle Raisers Association, plantations, sharecroppers and tenant farming (7 collections), United States Department of Agriculture, Grazing Industry Papers, WPA Records, and scrapbooks pertaining to cattle, cotton, and numerous other related topics.

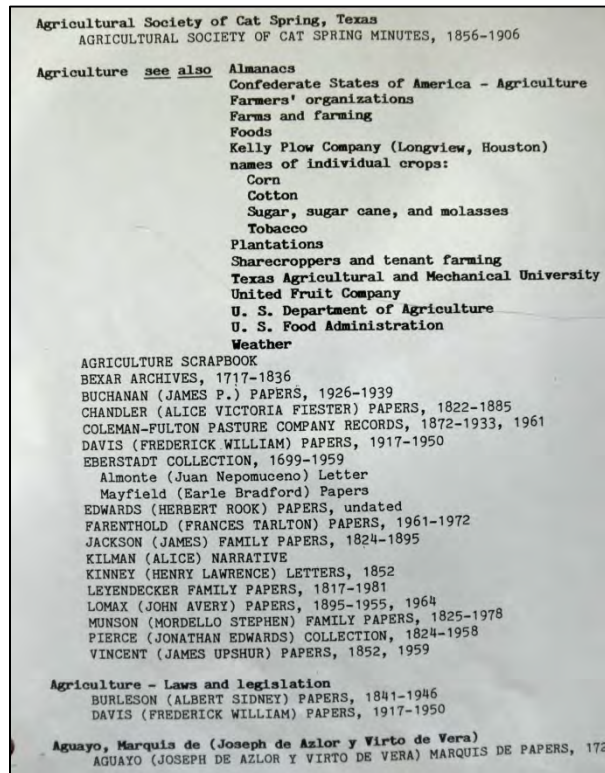


Figure 2-13. The Subject Index includes numerous entries about agriculture and related topics that are represented in specific collections.

- Finding Aids: The Aids are arranged by collection and describe the contents of each one. Large collections have their own Archives/Manuscripts Inventories. The Subject Index, Finding Aids, and Archives/Manuscripts Inventories all are located in the CAH's public reading room.

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► Photographs

Two finding aids help the researcher locate specific images:

- Photographs Index: Subjects listed in the Photographs Index (*Figure 2-14*) pertaining to agriculture include beekeepers, cattle breeders, cattle marking, cotton gins and ginning, cotton growing, cowboys, fences, log buildings, ranching, stables, turkeys, and windmills.

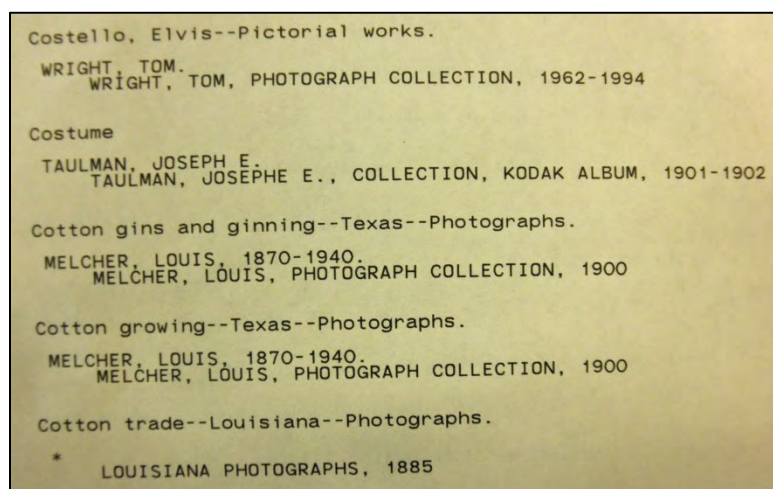


Figure 2-14. The Photographs Index is a good place to start when identifying collections that include visual materials pertaining to agricultural topics.

- Visual Materials Index: The Visual Materials Index (*Figure 2-15*) is more detailed than the Photographs Index and, thus, more helpful to the researcher interested in specific agricultural topics. Under the broad heading of Agriculture, references are made to farms and farming, grain elevators, names of individual crops (corn, cotton, oranges, rice, sugar and sugar products, wheat, orchards), plantations, ranches and ranching, and sharecroppers and tenant farming.

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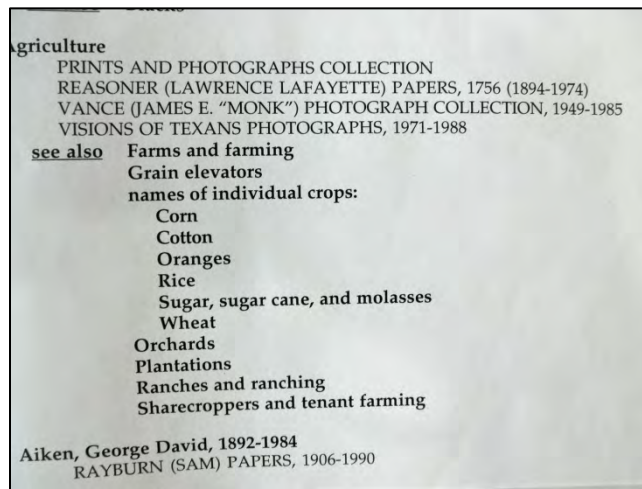


Figure 2-15. Topics that are listed under "see also" help researchers access imagery depicting a wide range of agricultural activities and products.

► Newspapers

There are two guides to the newspapers and two indexes that are arranged by biographical name and topic. The guides are:

- **Keyword Title Index to the Texas Newspaper Collection:** This guide (*Figure 2-16*) is organized, first, alphabetically by the name of the newspaper and second, by keywords in the titles.
- **Texas Newspaper Holdings by City:** This guide (*Figure 2-17*) is a simple alphabetical listing by city and then by the name of the newspaper. The format (original, microfilm) is indicated, and a list of dates or date ranges that are available at the Dolph Briscoe Center for American History is provided.

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KEYWORD TITLE INDEX TO THE TEXAS NEWSPAPER COLLECTION

KEYWORD	COMPLETE TITLE	CITY
Advocate	Constitutional Advocate and Texas Public Advertiser (w)	BRAZORIA
Advocate	Daily Advocate (d)	DALLAS
Advocate	Daily Advocate(d)	VICTORIA
Advocate	El Paso City and County Labor Advocate (w)	EL PASO
Advocate	Epworth Advocate (u)	BROWNWOOD
Advocate	Home Advocate (w)	JEFFERSON
Advocate	Labor Advocate (w)	EL PASO
Advocate	Marshall Meridian and Pacific Railroad Advocate (u)	MARSHALL
Advocate	McKinney Advocate (w)	McKINNEY
Advocate	Palestine Advocate (w)	PALESTINE
Advocate	People's Advocate (tw)	HOUSTON
Advocate	People's Advocate (w)	AUSTIN
Advocate	Portland Advocate (w)	PORTLAND
Advocate	Prohibition Advocate (w)	DALLAS
Advocate	Rural School Advocate (u)	DALLAS
Advocate	San Luis Advocate (w)	SAN LUIS
Advocate	South Austin Advocate (u)	AUSTIN
Advocate	Southern Mercury Texas Farmers' Alliance Advocate (w)	DALLAS
Advocate	State Week and Austin Forum-Advocate (w)	AUSTIN
Advocate	Texas Christian Advocate (u)	DALLAS
Advocate	Texas Christian Advocate (w)	AUSTIN
Advocate	Texas Christian Advocate (w)	DALLAS
Advocate	Texian Advocate (w)	AUSTIN
Advocate	Trinity Advocate (w)	GALVESTON
Advocate	Van Horn Advocate (w)	VICTORIA
Advocate	Victoria Advocate (d)	VICTORIA
Advocate	Victoria Advocate (w)	AUSTIN
Affairs	Truth About County Affairs (w)	SAN ANTONIO
AFL-CIO	AFL-CIO Weekly Dispatch(w)	HOUSTON
Age	Age (d)	HALLSVILLE
Age	Age (w)	HOUSTON
Age	Houston Age (d)	HOUSTON
Age	Spirit of the Age (tw, w)	WACO
Agriculture	Texas Agriculture (m)	SAN ANTONIO
Alamoner	Alamoner (w)	AUSTIN
Alcalde	Alcalde (u)	URBENO
Aldeano	El Aldeano (w)	KINGSVILLE
Alert	Alert (w)	AUSTIN
Almanac	Texas Almanac-Extra (tw)	HOUSTON
Amateur	Houston Amateur (m)	BRECKENRIDGE
Americas	Houston (d)	FORT WORTH

Figure 2-16. The Keyword Title Index is a quick way to determine if the Dolph Briscoe Center for American History has any newspapers for a specific geographic area in its holdings.

SAN MARCOS

Asterope (w)	
[May 8, 1943-Oct 23, 1945: incomplete]	OR, MF†*
Citizen Advertiser (w)	
Apr 6, 20, May 4, 1966	OR
College Star (w)	
Aug 15, 1934;	
[Apr 18, 1945-May 7, 1947: incomplete]	OR
Daily Times-Herald (d)	
[Jul 1, 1912-Dec 12, 1914: incomplete]	MF†
(Microfilm on misc. San Marcos reel)	
Hays County Guardian (w)	
Feb 23-Nov 9, 1989	OR
Hays County Herald (w)	
Jul 22, Aug 26, 1938; Jul 26, 1940	OR
Hays County Times and Farmer's Journal (w)	
[Jul 3, 1886-Mar 29, 1912: incomplete]	FC
[May 2, 1890-Jul 21, 1910: incomplete]	OR, MF†
(Microfilm on misc. San Marcos reel)	
Laurel (u)	
[Oct 11, 1926-May 23, 1927: incomplete]	MF†
(Microfilm on misc. San Marcos reel)	
People's Era (w)	

Figure 2-17. The list of holdings by city and date provides additional detail that assists the researcher in determining if newspapers will be a likely source of information for developing historic contexts or finding biographical and other specific information.

- Biographical Index:** This card index is organized by the last name of the individual. The name of the newspaper in which the name appeared, together with the date of the article and the page within the newspaper, are provided on an index card, which is housed in a card catalog. Newspapers from which the names were abstracted were the *Dallas Herald*, *Houston Daily Telegraph*, *Houston Republic*, *Northern Standard* (Clarksville), *Telegraph and Texas Register* (Houston), *Texas National Register* (Washington), *Texas Sentinel* (Austin), and *Texas State Gazette* (Austin). The date range for the references is 1830-1870; inclusion in the index does not necessarily indicate that the referenced newspaper is in the collections of the CAH.
- Biographical and Topic Index to Selected Newspapers:** Also in card format, this index (Figure 2-18) is biographical and topical. It is organized by the name of the newspaper first. Newspapers represented in the card catalog are the *Abilene Daily Reporter*, *Alpine Avalanche*, *Commerce Journal*, *Dallas Daily News* (which also has its own separate index on microfilm in the Center's collections), *Denison Gazette*, *Denison Herald*, *Denison Daily News*, *El Paso Herald*, *Fort Worth Democrat*, *Fort Worth Record*, *Fort Worth Gazette*, *Jacksboro Echo*, *San Antonio Express*, *Free Press* (San Antonio), *La Prensa* (San Antonio), *San Antonio Light*, *San Antonio Evening News*, *Sherman Courier*, *Sweetwater Daily*

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Reporter, Whitesboro News, Whitewright Sun, and Wichita Daily Times; the date range is 1870-1936. On each card, information provided is the name of the individual or topic, a brief summary of the contents of the article, and a reference to the date and page number of the article. As with the first index, inclusion does not necessarily indicate that the newspaper cited is in the CAH collection.

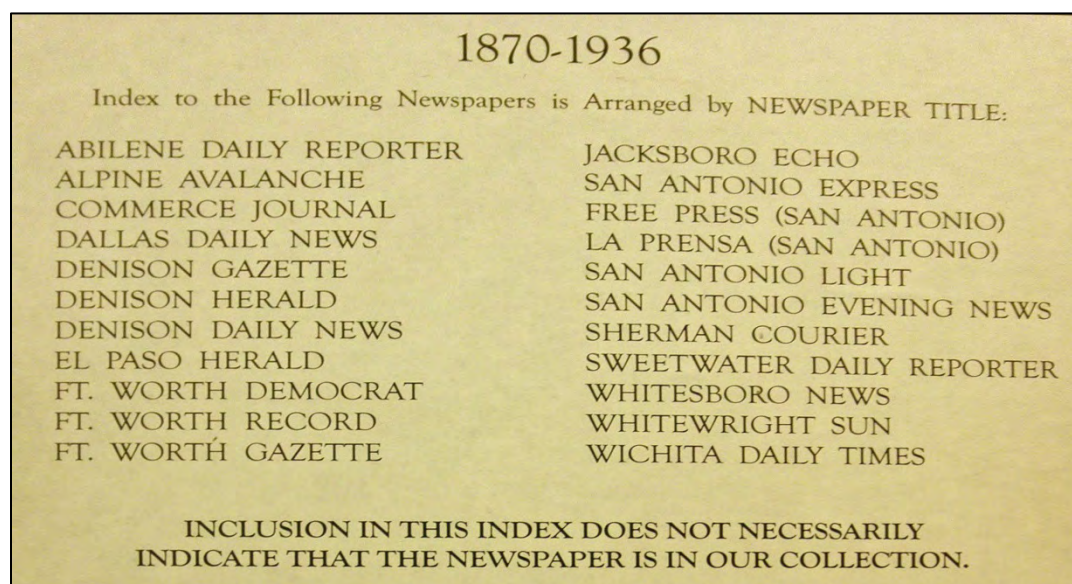


Figure 2-18. Because there are nine newspapers represented in the index that are likely to include information pertinent to Central Texas agriculture, this research tool is one of the most helpful in developing contextual information about specific agricultural activities and biographical information about agriculturists.

► Periodicals

An index to many periodicals, as well as a number of other sources that include articles about Texas agriculture, is called General Reference Index; it can be found in card catalog format in the public search area of the Center.

Dolph Briscoe Center for American History – Collections

Archives and Manuscripts Collections

Following are examples of archives and manuscripts collections that describe agricultural history, focus on a particular crop, and record the activities of a specific company and rancher within the study area.

Grazing Industry Papers

In 1935, the Grazing Service of the Department of the Interior requested that the Historical Records Survey undertake a project to compile the history of grazing in 17 states, including Texas. The work eventually incorporated historical records from the western range and livestock industry, including journals, diaries, and interviews with ranchers. The size of the collection is six feet and is focused on the history of grazing in Texas. Researchers used newspaper clippings, magazines, reports, and essays to document the livestock industry, defined as cattle and horses, and ranching in general. The collection includes a bibliography for the History of Grazing and covers the period from 1537 to the 1930s.

Guadalupe County Scrapbook

The Guadalupe County Scrapbook is a collection of articles about particular topics, obituaries, and miscellaneous file material. The Scrapbook has been un-bound and now is housed in file folders. Materials in the general history folder include newspaper clippings about the history of the county in English and German, programs from special events, interviews with residents, and WPA correspondence describing the county. There are descriptions of local landmarks; histories of organizations; biographies; special illustrated articles about the county's communities (*Figure 2-19*); reports by local students about county, community, and family histories; and articles about ethnic communities. Materials in the obituary folder (some of which have been misfiled and are housed in the history folder) consist of obituaries from the *Seguin Bulletin*, *Enterprise*, *San Antonio Express*, and *Gazette-Bulletin*. They are organized in rough alphabetical order.

Cotton Scrapbook

The Cotton Scrapbook is a collection of articles clipped from newspapers (*Figure 2-20*) and other publications, and complete issues of articles from journals and trade publications. They date from the early-to-mid twentieth century.

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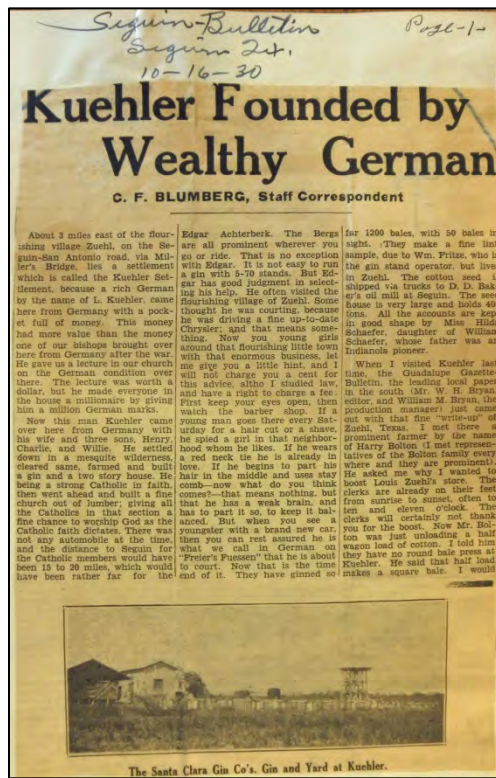


Figure 2-19. An article in the Guadalupe County Scrapbook (Box 3L226, Dolph Briscoe Center for American History, The University of Texas at Austin) provides an illustrated history of a small community, describing its origins and economy, and listing families associated with it.



Figure 2-20. An article in the Cotton Scrapbook (Box 3L142, Dolph Briscoe Center for American History, The University of Texas at Austin) records the decline of cotton farming and rise of cattle ranching in the Blackland Prairie region in the late 1930s.

Alliance Gin Records

The Alliance Gin Records, 1890-1915 (Figure 2-21), document the activities of a Buda cotton ginning cooperative incorporated as the Buda Alliance Milling and Ginning Company. The records include the charter; bylaws of the Buda Milling, Ginning, and Mercantile Association of Farmers Alliance; minutes of meetings; lists of stockholders; and production records.

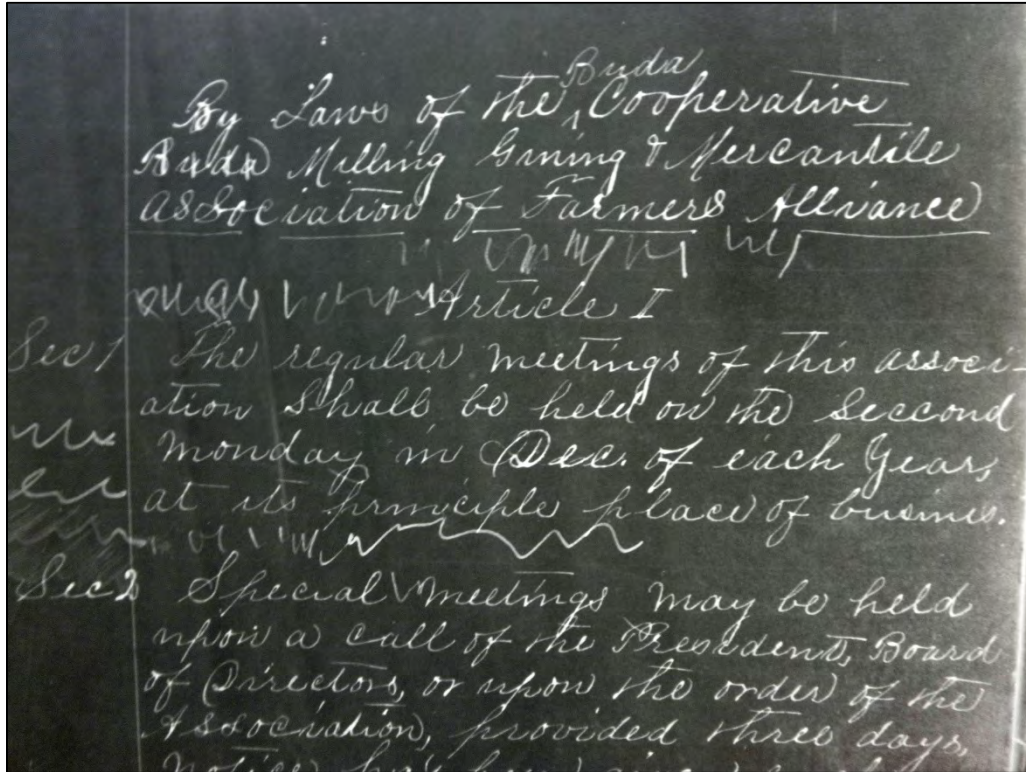


Figure 2-21. The gin records (Box 2A136, Dolph Briscoe Center for American History at The University of Texas at Austin) point to the importance of cotton in a county more-usually associated with the livestock industry.

Michael Erskine Papers

The Michael Erskine Papers document the activities of an important Guadalupe County landowner and cattleman in the mid-nineteenth century. They document his enterprises and a cattle drive from his ranch headquarters on the south side of the Guadalupe River (moved to the Texas Tech Ranching Heritage Center). A similar collection at the CAH is the papers of John Wheeler Bunton, Hays County rancher.

► Photographs

While there are numerous collections that have images of activities associated with agriculture as well as crops, livestock, and buildings, only one photographic collection appears to include images pertinent to the study area.

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Prints and Photographs Collection (Cotton Fields Pictures)

This small collection of photographs identified as probably having been made in Central Texas depicts fields of growing cotton.

TEXAS STATE LIBRARY AND ARCHIVES COMMISSION

The Texas State Library and Archives Commission (*Figure 2-22*) includes two divisions that hold primary and secondary sources pertaining to agricultural history, properties, and statistics; and individuals associated with Texas agriculture:

Archives and Manuscripts Division

The Archives and Manuscripts Division houses the permanently valuable official records of Texas government and other historical resources. It includes archival government records from the eighteenth through the twentieth centuries, newspapers, journals, books, manuscripts, photographs, maps, and other historical resources. It also includes a name index to selected published works in the catalog.

Genealogy Resources Division

The Genealogy Resources Division holds both microfilm and published works. Microfilm includes the following resources that are helpful to agricultural research:

- Federal census schedules (population: free; also available online) for Texas 1850-1930 (*Figure 2-23*).
- Federal census schedules (population: slave; also available online) for Texas 1850-1860.
- Federal census schedules (agriculture) for Texas 1850-1880.
- County tax rolls, and county records on microfilm for Atascosa, Bandera, Bastrop, Bexar, Blanco, Caldwell, Comal, Frio, Galveston, Gillespie, Guadalupe, Hays, Karnes, Kendall, Kerr, Kinney, Llano, McMullen, Medina, Uvalde, and Wilson counties; records from other counties are available on interlibrary loan.

Published works pertinent to agricultural studies include county soil surveys, and county, family, and cemetery records (*Figure 2-24*). County soil surveys and selected county histories are listed in *Appendix B*.

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Figure 2-22. The Texas State Library and Archives Commission holds numerous government and private manuscript, map, and photographic collections pertinent to the history of agriculture in Texas, as well as secondary sources that focus on the histories of Texas counties.

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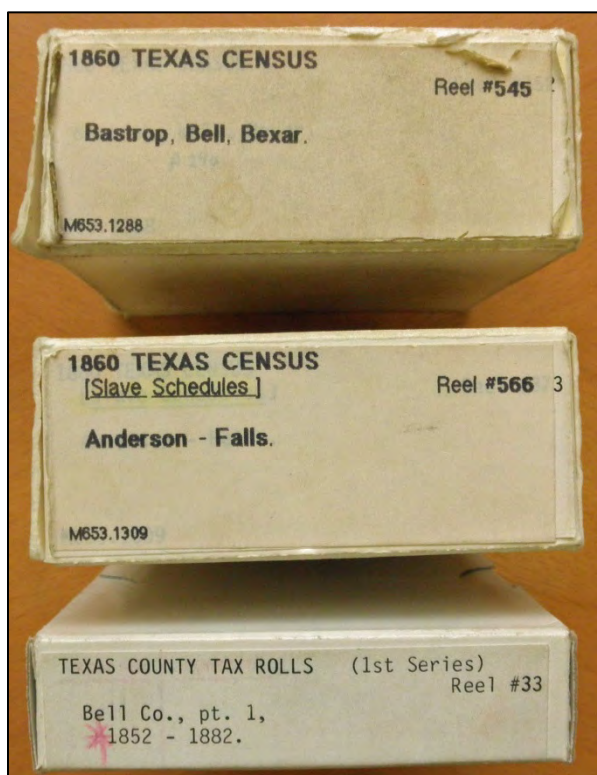


Figure 2-23. Free and slave federal census schedules are available on microfilm for viewing for all Texas counties as well as tax rolls dating to the formation of each county.



Figure 2-24. TSLAC has a large collection of commonly found and rare publications organized by county and available to the public on open shelves. Many of the works include information that is difficult to access elsewhere; the fact that the publications often were limited in numbers makes their availability at TSLAC particularly helpful.

Texas State Library and Archives Commission – Collections

Collections in the Archives and Manuscripts Division that are pertinent to agricultural studies include the following:

Texas Planning Board:

Works Progress Administration (WPA) Studies, 1929-1937: The series includes reports and maps from a project sponsored by the U.S. WPA (*Figure 2-25*). The project was designed to assist the Board in its studies of the natural resources and economic conditions of the state. Data were used to promote economic expansion and development, primarily in the fields of agriculture and industry. Coordinating entities were the Bureaus of Economic Geology, Engineering Research, and Business Research at The University of Texas, all of which published studies based on the WPA work. Those studies are available at both the Texas State Library and Archives Commission and at the Dolph Briscoe Center for American History at The University of Texas at Austin.

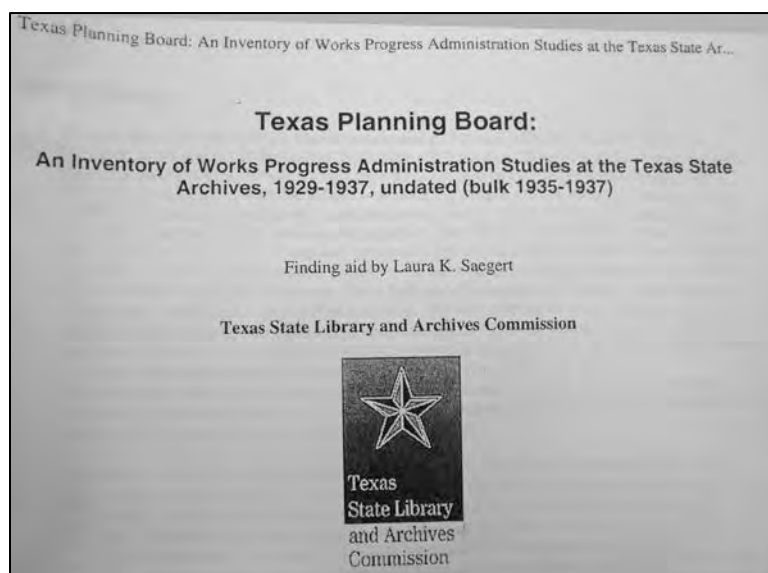


Figure 2-25. The finding aid for the Texas Planning Board records provides a detailed guide that allows the researcher to locate files useful to development of agricultural contexts.

The Texas Planning Board also published official reports, which included maps and charts dating 1935-1939. Topics covered included use of natural resources, changes in population 1890-1930, watersheds, agricultural products of Texas by census years from 1890-1935, and hydroelectric power. Maps and charts in the collection depict major natural areas, rural and urban populations; White, Negro, and Mexican populations; Summary Texas Land Situation with Particular Reference to Lands Available for Farm Homes; extent of cropped areas; natural regions of Texas; normal annual rainfall; climatological data (rainfall, temperature, average growing season); a general soil map of Texas; forest regions; and charts of land use by county. A broad category of crop, livestock and lumber production includes charts,

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tables, notes, letters, and maps concerning native vegetation, distribution of land used for farming and grazing, crop and livestock production, the cotton industry, the cattle industry, and lumber production. Specific records depict distribution of acreage for farming and grazing by county and other topics related to agriculture. Most are specific to the late 1920s through the late 1930s.

Texas Department of Agriculture, 1924-2001 (bulk 1960-1997)

The collection consists of minutes, agenda, organization charts, reports, photographs, etc. Major topics include administration of programs that provided loans and grants to agriculture-related businesses, promotion of agricultural diversification in Texas, establishment of environmental rules and regulations, management of seed quality and development, pesticides and pest eradication, herbicides, and ground and surface water.

Photographic media (1968-1996) depict livestock, agricultural products, agricultural processing, farmers, ranchers, crops, agricultural equipment, agricultural pests, and other topics.

Reports, 1951-1990, document daily and weekly market reports on a variety of Texas commodities, including poultry and eggs, rice, fruits and vegetables, grains, and pecans.

Motion picture, video, and sound recordings, 1969-1996, include imagery of Texas agricultural products in all phases from field to retailer, tours of agricultural facilities including processing plants, gins, sheds, and wineries.

Photographic materials, 1968-1996, include copy photographs of original late nineteenth- and early twentieth-century historic photographs taken in conjunction with the Family Land Heritage Awards.

Prints and Photographs Collection

A two-volume index in table form (*Figure 2-26*) is organized in alphabetical order by subject and includes call numbers, collection titles, number of items in each collection, and comments. More than 60 volumes are arranged by collection number, and each collection is described. One group of photographs, the Fannie Ratchford Photograph Collection, consists of 1,533 photographs, 1,066 negatives, 44 photostats, 9 postcards, 7 pencil sketches, and 1 woodcut of old homes in Texas. Buildings are identified. The collection is arranged alphabetically by the names of towns or counties and then by names of owners or homes. While there is a heavy concentration on buildings in towns, there also are some images depicting rural homes and outbuildings.

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Fannin, Missouri Pinckney	0001/064	Missouri Pinckney Fannin Photograph
Fannin, Missouri Pinckney	0001/102	People Collection
Fannin, Missouri Pinckney	1942/005	Missouri Pinckney Fannin's Tombstone Photograph
Farabee, Ray (Senator)	1981/155	Current Events
Farenthold, Frances	1972/174	House of Representatives Special Session Photographs, 1972
Farm Life	1963/185	Stugard Collection
Farm Life, 19th Century	1963/283	A. Garland Adair Collection
Farmer, Garland	1963/283	A. Garland Adair Collection
Farming	1968/028	Roscoe Runge Collection
Farming	1972/087	Mrs. Robert Watrous Photographs
Farming	1976/031	Supplement to William Deming Hornaday Collection
Faubian, H. E. (Mrs.)	1951/005	Mrs. H. E. Faubian Collection
Faulkner, J. M.	1970/141	State Banking Commission Swearing-in Ceremony, 1970
Fayette County, Texas	1970/100	Winedale Festival Photographs
Fayette County, Texas	1980/085	Mrs. John Machann Collection
Fencing, German Students	1968/028	Roscoe Runge Collection
Fentress, Texas	1970/101	Fannie Hatchford Collection
Ferguson, James	0001/102	People Collection
Ferguson, James	1954/044	Earl B. Miller Collection
Ferguson, James	1956/046	Bill Gardner Collection

Figure 2-26. The guide to photographs in the TSLAC collections is organized by topic and leads the researcher to collections likely to include images depicting agricultural activities.

Maps Collection

A six-volume index is organized by subject (Figure 2-27). A column titled "Primary Term" gives the research information about the main subject of the map; the term is geographical with the exception of proper names. A column titled "Secondary Term" tells the researcher whether the map is a survey, plan, plat, or other depiction of various types of properties such as highways, railroads, cemeteries, post offices, etc.; it refers to the major subjects found on each map. A third column provides the date of the map, and a fourth column is the map number.

PRIMARY TERM	SECONDARY TERM	MAPDATE	MAPNUM
Bastrop County	geologic map	1902	7055
	highway map	1940	4791
	highway map	1940 c.	6171
	highway map	1961	5046
	highway map	1963	7600
	highway map	1972	5361
	highway map	1983	5736
	highway map	1988	7124
	highways	1934	1485m
	military bases	1961	5046
	military bases	1972	5361
	military bases	1983	5736
	military bases	1988	7124
	mines or quarries	1961	5046
	mines or quarries	1972	5361
	mines or quarries	1983	5736
	mines or quarries	1988	7124
	mines or quarries	1961	5046
	oil fields	1972	5361
	oil fields	1972	5361

Figure 2-27. The guide to the map collection is sufficiently detailed to lead the researcher to a wide range of cartographic resources depicting the Central Texas area.

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TEXAS DEPARTMENT OF AGRICULTURE

The Texas Department of Agriculture (*Figure 2-28*) holds original records relating to the Department's Family Land Heritage Program. The Program was established in 1974 to recognize families who have maintained land in continuous agricultural production for 100 years or more. The property must have been maintained throughout the 100 years by the same family, whether through direct relatives or by marriage. The nominated property must consist of 10 acres or more with agricultural sales of \$50 or more a year; if the property is less than 10 acres, sales must total at least \$250 per year. Owners must actively manage the everyday operation of the farm or ranch. While renters are allowed, a minimum of 10 acres must have been retained in the applying family for agricultural production with sales of at least \$50 annually.

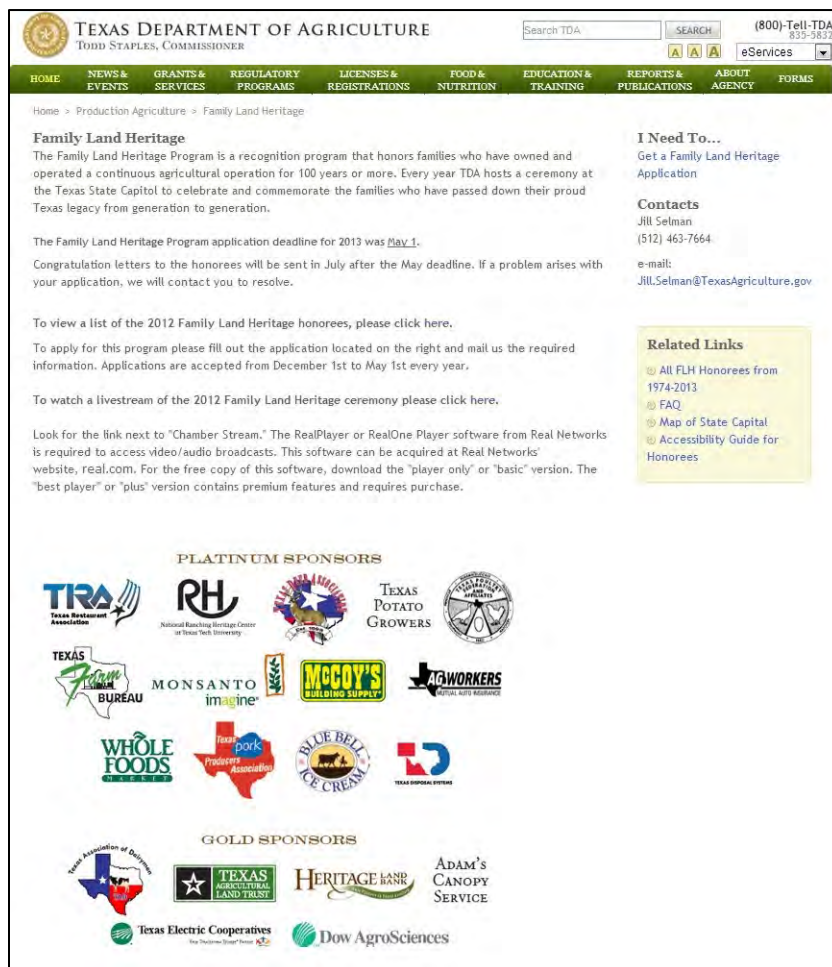


Figure 2-28. The Texas Department of Agriculture recognizes families that have owned their property and used it for agricultural purposes for a minimum of 100 years. The 13-county Central Texas region is particularly rich in such properties.

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Applicants for recognition are urged to supplement their applications with supporting documentation about the land ownership, history of the property, and historic photographs. These materials become part of the property file and are retained by the Texas Department of Agriculture. Therefore, information about each property that is identified in the published annual report is supplemented by file material.

The Department publishes a guide to properties recognized by the program (*Figure 2-29*). The guide is published annually, is organized alphabetically by county, and includes summary information about each recognized farm or ranch. The information provides a brief history of the property and general data about its location within the county; some entries include historic photographs.

Through the Public Information Office of the Department of Agriculture, researchers can request a list of recognized farms and ranches, 1974-2011 (*Figure 2-30*). The list is by county and then alphabetically by the name of the property. The date when the farm or ranch was established follows the name, and the date of designation is shown in parentheses. A second column provides a brief description of the property's location, usually stating its distance by road from the nearest community, town, or city. More-specific information about location is available in the file that supports the nomination. By the end of 2011, a total of 505 properties had been designated in the 13-county study area, for an average of 38.8 properties per county. The counties with the greatest number of designated properties were Guadalupe (70) and Williamson (65); the county with the fewest number was Hays (14).

A sample annual publication is listed and discussed in *Appendix B* of this study.

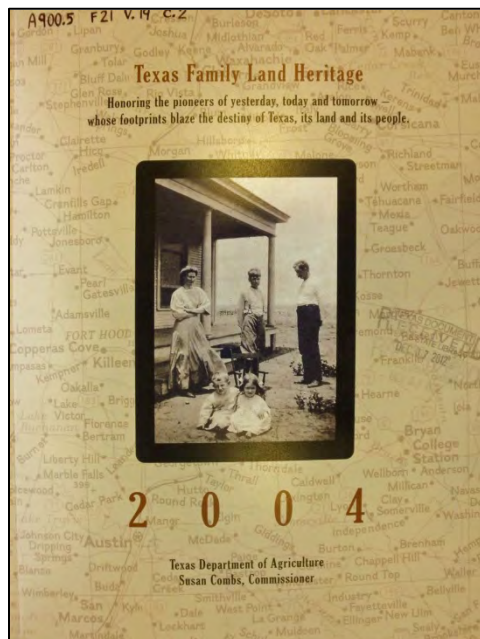


Figure 2-29. Guides published by the Texas Department of Agriculture provide summaries of the often-voluminous information provided by families seeking to obtain recognition of their properties.

Bell County	
Bishop-Farrell Cedar Creek Farm, 1860 (1998)	
Burns Farm, 1880 (1993)	
Elmore Ranch, 1876 (1977)	
Fischer Farms, 1883 (1995)	
Hannon Farm, 1876 (1991)	
W. P. Hendrick Homeplace, 1885 (1990)	
Hickerson Family Farm, 1894 (1994)	
Hoover Farm, 1870 (1997)	
Irish Place, 1880 (1980)	
Keifer Marshall Farm, 1848 (1974)	
Maedgen Farm, 1872 (1974)	
Vernie C. Marshall Farm, 1848 (1974)	
McCulloch Farm, 1849 (1974)	
Muehlhause Farm, 1877 (1987)	
Richter's Rocking A&R, 1876 (1990)	
Rotthoff/Wilde Farm, 1901 (2002)	
J. R. Sanderford Estate, 1870 (1976)	
Splitterger Farm, 1891 (1993)	
Stafford Farm, 1872 (1975)	
Sutton Farm and Ranch, 1856 (1999)	
Thompson Farm, 1895 (1996)	
Three Forks Farm, 1887 (1994)	
Wallace Farm, 1873 (1989)	
Ware Farm, 1874 (1974)(2000)	
B. E. Whittington Farm, 1868 (1975)	

Figure 2-30. The TDA inventory of registered heritage properties is a good place to start when trying to determine if survey areas include noteworthy agricultural sites and landscapes.

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TEXAS HISTORICAL COMMISSION

The Texas Historical Commission (THC) (*Figure 2-31*) includes the History Programs Division and a library that houses information helpful to studies of agricultural history, properties, and individuals associated with the history of Texas agriculture.

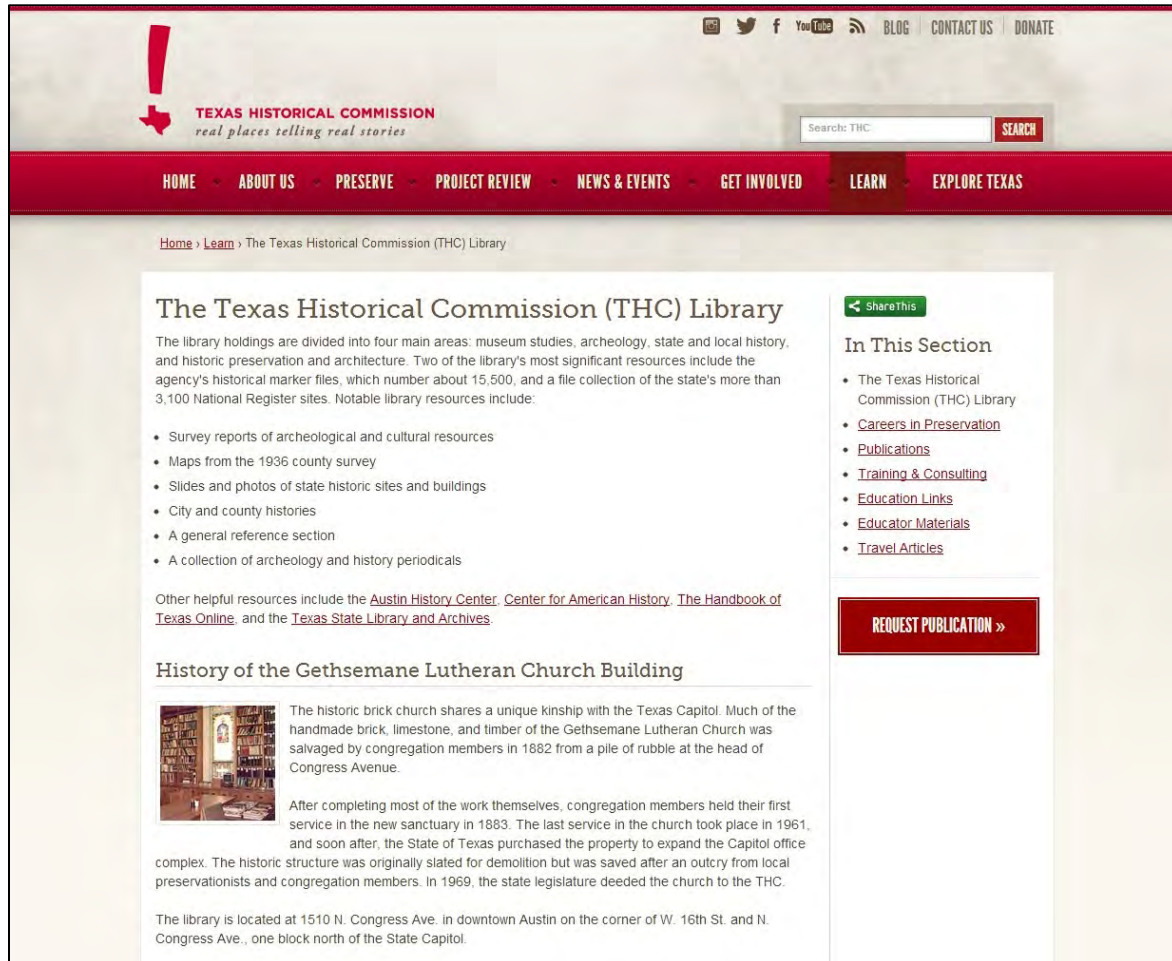


Figure 2-31. The THC maintains files about historic properties and a library that focuses on Texas history.

History Programs Division

The History Programs Division administers the National Register of Historic Places (NRHP), Registered Texas Historic Landmarks (RTHL), and Historic Texas Cemeteries (HTC) programs. It also assists with the designation processes and provides research guidance. Properties that meet criteria established by the State of Texas (RTHL and HTC) or federal government (NRHP) are incorporated in the THC's Texas Historic Sites Atlas, an online source that is a list of nearly 300,000 site records, including information about NRHP, RTHL, HTC, and other properties.

The History Programs Division houses the following records that pertain to agricultural history in the study area (*Figure 2-32*):

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Survey Finding Aid

(03/10)

Definitions:
I=Images: Contains any of the following: slides, color photos, b & w photos, negatives or zeroes.
R=Repts.: Contains an analysis of survey data.
F=Forms: Contains THC or similar survey forms.
M=Maps: Contains map(s).
 Quality and detail of these items varies widely.
 List sorted by county, city and year

County	City	Title	Vol.	Surveyor	Sponsor	Year	I	R	F	M	Binding
Anderson	Palestine	Historic Resources Survey of Palestine	1-4	Hardy Heck Moore	City of Palestine	1991	*	*	*		Binder
Anderson	Palestine	Historic Resources Survey of Palestine		Hardy Heck Moore	City of Palestine	1991		*	*	*	Spiral
Anderson	Palestine	Historic Resources Survey of Palestine, Phase 3		Hardy Heck Moore	City of Palestine	1993		*	*	*	Spiral
Anderson	Palestine	Hist. & Arch. Resources of Palestine-Multi-prop. Nom.		Hardy Heck Moore	City of Palestine	1998	*	*	*	*	Spiral
Anderson	Palestine	Historic Resources Survey Review: Palestine		Diane E. Williams	City of Palestine/CLG	2000	*	*	*	*	Spiral
Anderson	Palestine	Historic Resources Survey Review: Palestine		Diane E. Williams	City of Palestine/CLG	2000	*	*	*	*	Binder
Angelina		Angelina Co. Historic Sites Survey & Multi-prop. Nom.	1-2	Victor and Victor		1986		*	*	*	Spiral
Angelina		Angelina County Historic Sites Survey		Victor and Victor		1986		*	*	*	Spiral
Angelina		Angelina County Historic Sites Survey		Victor and Victor		1986	*	*	*	*	Binder
Atascosa		Historic & Cultural Resources Survey		Ralph Newlan	Atascosa Co. CLG		*	*	*	*	Binder
Atascosa		Historic Resources Survey of Atascosa Co., Phase I					*	*	*	*	Binder
Atascosa		Historic & Cultural Resources of Atascosa Co., Phase I		Ralph Newlan	Atascosa Co. CLG	1994	*	*	*	*	Spiral
Atascosa		Historic Resources Survey of Atascosa Co., Phase II		Ralph Newlan	Atascosa Co. CLG	1995	*	*	*	*	Binder
Atascosa		Historic & Cultural Resources Survey, Atascosa Co.		Newlan/Knight & Associates	Atascosa Co. CLG	1996	*	*	*	*	Binder
Atascosa	Jourdanton	Historic Resources Survey of Jourdanton, TX		Knight & Associates	Atascosa Co. CLG	1998	*	*	*	*	Binder
Atascosa	Leming	Historic Resources Survey of Leming, TX		Knight & Associates	Atascosa Co. CLG	1998	*	*	*	*	Binder
Atascosa	Lytle	Historic Resources Survey of Lytle, TX		Knight & Associates	Atascosa Co. CLG	1998	*	*	*	*	Binder
Atascosa	Lytle	Historic Resources Survey of Lytle, TX		Knight & Associates	Atascosa Co. CLG	1998	*	*	*	*	Binder
Atascosa	Potter	Historic Resources Survey of Potter, Texas		Knight & Associates	Atascosa County/CLG	1998	*	*	*	*	Binder
Austin		Austin Co. Historic Preservation		South West Planning	Austin Co.		*	*	*	*	Spiral
Austin		Austin Co. Historic Preservation I		South West Planning	Austin Co.	1975	*	*	*	*	Other
Austin		N/A				1981	*	*	*	*	Binder
Austin		N/A				1981	*	*	*	*	Other
Bastrop	Bastrop	Old Homes in Bastrop		Aileen Short		c. 1961	*	*	*	*	Other

*Cross-referenced item alphabetized under this county.

Figure 2-32. The History Programs Division maintains a Survey Finding Aid that is organized by county, city (where appropriate), title of report, name of surveyor, sponsor of the work, year of survey, and record of whether the surveys include images, analysis of survey data, THC or similar survey forms, and maps.

- THC-sponsored surveys: In the 1970s, the THC sponsored county-wide historic structures surveys. Architecture students under the direction of THC staff conducted windshield level surveys of numerous Texas counties, including both rural and urban properties. They entered information on Historic Sites Inventory Forms that included detailed data and attached a large format black-and-white photograph. The records are housed in the History Programs Division in metal file cabinets and organized by county. Rural properties within each county are designated with the heading "RUR;" examples of rural agricultural properties were recorded in Bexar, Comal, Hays, Guadalupe, Hill, McLennan, Travis, and Williamson counties.
- Council of Government (COG), County Historical Commission, TxDOT-sponsored surveys: The History Programs Division also houses numerous county- and community-level surveys that were sponsored by councils of government, county historical commissions, agencies such as TxDOT, and specific cities (Figures 2-33 and 2-34). These are housed in three-ring binders or are spiral bound. They are arranged by county, except for studies that are regional in scope. A finding aid, "Survey Finding Aid," is current to March 2010 and includes information about the county and city in which the survey occurred; the surveyor, sponsor, and year of survey; and the contents (images, textual analysis, survey forms, maps).

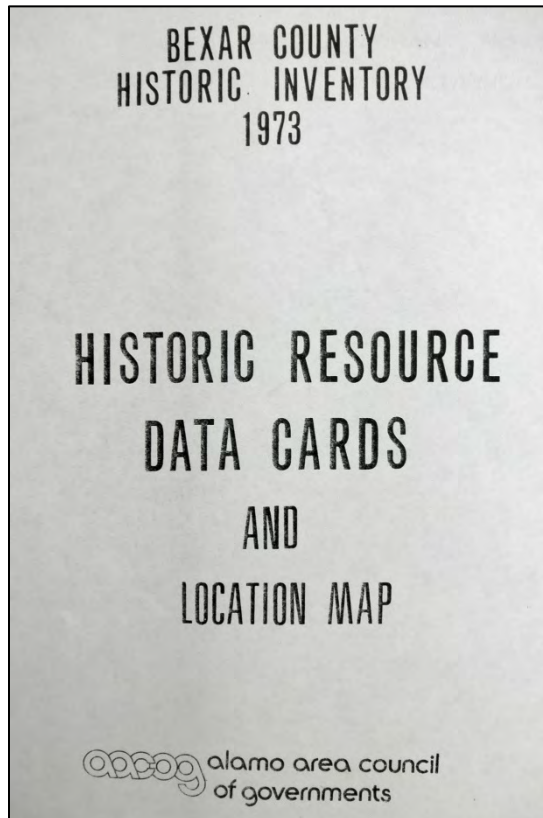


Figure 2-33. The Bexar County Historic Inventory of 1973 was one of the earliest COG-sponsored historic resource surveys conducted. The information in the survey is particularly helpful because it recorded rural properties in areas that have been heavily impacted by development in recent years.

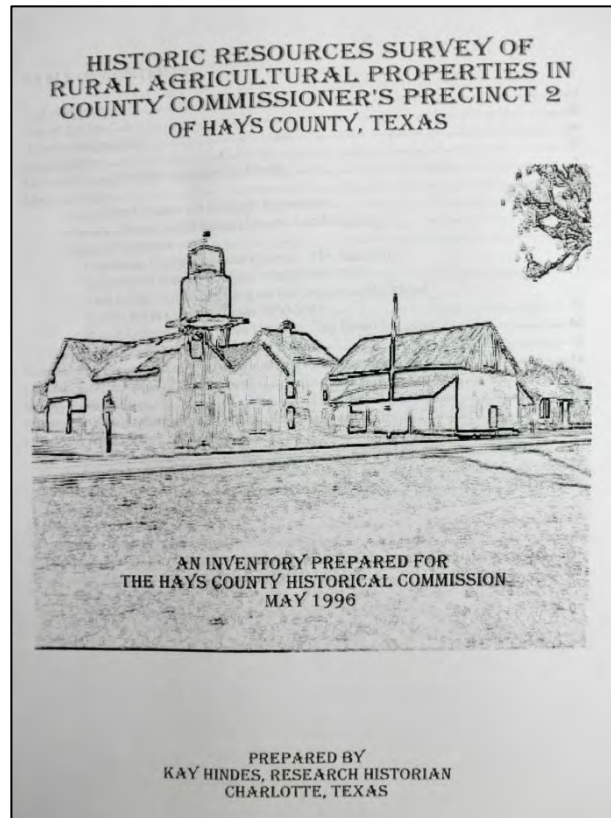


Figure 2-34. A historic resources survey of a precinct in Hays County completed in 1996 recorded 123 properties in rural locations. It included information about rural historic landscapes and identified three historic contexts (ranching, farming, and dairying) that were useful in evaluating the properties.

Texas Historical Commission – Collections

A number of these surveys are pertinent to agricultural landscape studies:

- ❖ Historic site inventory and bibliography of the Brazos River Basin conducted for the Corps of Engineers (missing from the collection).
- ❖ County-level survey conducted in Bexar County by Lance, Larcade & Bechtol Architects for the Alamo Area Council of Governments in 1973. A total of 54 properties were recorded for AACOG in Quadrant No. 7, North Settlement of Bexar County. Properties were described on printed forms and photographed.
- ❖ 1989 survey report prepared by the Environmental Section of the Texas Department of Highways and Public Transportation that recorded urban and rural properties in the vicinity of Selma, including buildings formerly part of a farm.
- ❖ Three surveys sponsored by the Hays County Historical Commission that recorded rural properties in the eastern and western parts of the county. Two of them, completed in 1993 and 1995, included photographs and written inventories. A third, completed in 1996 by Kay Hindes (see *Figure 2-34*), focused on rural agricultural properties in one Hays County precinct. It included a historic context and is discussed in the annotated bibliography of this report (*Appendix B*).
- ❖ A survey of northeast Travis County (*Figure 2-35*) completed in 2010 for the Travis County Historical Commission that included photographs and survey results together with a brief historical context that mentioned agriculture. The survey is discussed in the annotated bibliography (*Appendix B*).

Library

Paper copies of NRHP nominations are housed in the THC library (*Figure 2-36*), together with bound copies of cultural resource management reports organized by county, and published county histories and other secondary sources. Access to the library is by appointment only; access to cultural resource management reports is available only to individuals who have been approved by the Archeology Division of THC. Many of the published histories in the library collections are more readily accessible at the Texas State Library and Archives Commission, the Dolph Briscoe Center for American History, and other university collections.

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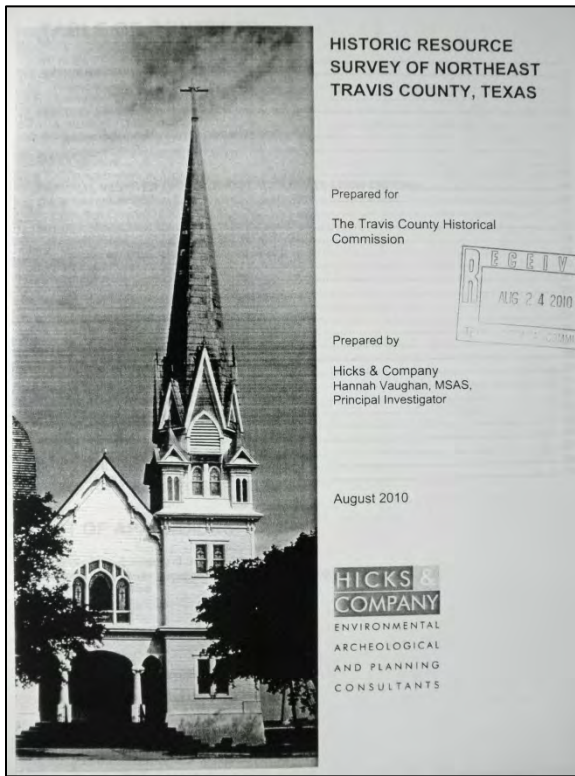


Figure 2-35. A survey of northeast Travis County was intended to serve as baseline documentation of historic resources and to provide preliminary context for further research and documentation of properties. Priority levels were assigned to each individual property and to the project area, which was assessed for historic districts and rural historic landscapes.



Figure 2-36. The THC library provides access to National Register nominations and a wide range of local histories that supplement the materials available in the Genealogy Resources Division of the Texas State Library and Archives Commission.

COUNTY COURTHOUSES

County courthouses within the survey area are located in San Antonio, New Braunfels, Seguin, San Marcos, Austin, Lockhart, Georgetown, Belton, Gatesville, Cameron, Marlin, Waco, and Hillsboro (*Figure 2-37*).



Figure 2-37. The Bastrop County Courthouse and annex and the Appraisal District office house records that are essential to the development of historic contexts and understanding of specific agricultural properties and landscapes during both reconnaissance- and intensive-level surveys.

Except in cases where the county has deposited original records in officially designated local repositories, each courthouse houses a similar set of records that are useful to historians. By county office, these include:

County Clerk

Deeds: Deeds (*Figure 2-38*) record the transfer of property beginning with the patenting of property by the State of Texas to a private citizen; they conclude with the most recent transfer of property. Affidavits often are found in deed records and may include valuable genealogical information about families associated with property transfers.

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Figure 2-38. Deeds are filed by the county clerk and record property transfers. More-recent records are available online in the clerk's office.

Materielmen's liens: Materielmen's liens record liens made on equipment, often related to agricultural activities. Information in these documents includes names of agriculturalists and suppliers, and descriptions of the machinery.

Mechanics liens: Mechanics liens record improvements made to properties in varying degrees of detail. The owner of a property gave a mechanics lien to the individual or company hired to make the improvements; the lien was released upon completion of the work and final payment.

Probate files: Probate files include records about a deceased individual such as date of death, inventory of estate assets, plats or maps, names of surviving relatives, and expenses of the estate. The contents of probate files usually are recorded in probate minute books.

Commissioners court minutes: Minutes record the official business of the county, including bridge and road building and other local improvements.

Oil and gas records: The records sometimes include affidavits that provide genealogical information not available elsewhere.

Irrigation records: Irrigation records provide information about the establishment and operation of irrigation canals; they often include maps and plats of the system that identify adjacent land owners and depict improvements on a landscape level.

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Death certificates: Required by the State of Texas beginning in 1903, these documents record the name of the deceased, date of death, next-of-kin, and reason for death. They also may record parentage of the deceased and location of birth. However, use of death certificates is limited. If not available through the county, they may be accessed at the Texas Department of Health in Austin.

Marriage records: Marriage records provide the dates and places of marriages and are filed by the name of the groom and maiden name of the bride.

School records: School records are organized by the name of the school and usually include lists of students; they may be used to supplement census records where those records are incomplete.

► District Clerk

District court case files: Case files (*Figure 2-39*) include records resulting from lawsuits and other legal matters, many of which are not recorded in district court minute books. They may include detailed interrogatories and other testimony, descriptions of the reasons for a suit's being filed, maps and plats, and other supporting documents.



Figure 2-39. Indexes to the case files provide the names of parties to suits and the numbers of case files. While some information about each case is available in bound volumes, individual case files include additional information, including exhibits such as maps.

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► Tax Collector

Tax abstracts (land): Abstracts (*Figure 2-40*) are organized numerically by a General Land Office-assigned abstract number and then alphabetically by the last name of the tax payer. They may be a helpful supplement to deed records when the researcher has trouble completing a chain of title due to a change in the owner's name, a death, or absence of complete deed records. Like state tax records, they may record improvements to property.



Figure 2-40. Tax abstracts are a quick way to identify ownership within specific land grants over many decades. Typically, the volumes are kept in the office of the tax collector-assessor, but too-often they are stored in basements and attics in the courthouse. Persistence may be required in locating them.

Tax plats (sometimes housed in appraisal district offices): Plats also supplement deed records; in coordination with mapping on USGS quadrangles, they are useful to understand changes in property ownership and the evolution of ownership landscapes.

► Appraisal District

Maps and plats: Maps and plats in the Appraisal District office (*Figure 2-41*), together with information usually available in computer format, show the most-current information about property ownership and legal descriptions. Occasionally, older plats originally housed in the office of the Tax Collector have been transferred to the Appraisal District.



Figure 2-41. The Appraisal District houses maps and current property ownership information. Many counties offer that information online; in other cases, researchers must visit the appropriate Appraisal District office.

An outline describing how to use county-level legal records appears in *Appendix C*.

CHAPTER 2: TYPES OF RESEARCH TOOLS AND THEIR USES

Chapter 2 identifies and describes selected primary source types and explains what each type offers researchers, the assets and limitations of each, how they can be used in reconnaissance- and intensive-level surveys, and where they are located. Information from Chapters 1-4 are summarized in *Table 2-1*. Information about secondary and unpublished sources appears in *Appendix B* (Annotated Bibliography) and *Appendix C* (How to Use County Records).

- ▣ County Tax Rolls
- ▣ Decennial Censuses (Population/Free)
- ▣ Decennial Censuses (Population/Slave)
- ▣ Decennial Censuses (Nonpopulation/Agricultural)
- ▣ County Records
- ▣ Archival Collections
 - Texas Planning Board Records: Agricultural Products of Texas
 - History of Grazing in Texas
 - Company Records
 - Family Records
 - Oral Histories
 - Scrapbooks
 - Photographs
 - Vertical Files
 - Newspapers
 - Periodicals
 - Government Programs

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Table 2-1. Summary of Chapters 1 through 4.

Source	Repository	Description of Source	Pertinent Agricultural Information				Useful for Reconnaissance-Level Surveys	Property-Specific Research Assists Use
			Ranching	Stock Farming	Farming	Dairying		
County Tax Rolls	CAH ¹ SAPL TSLAC	Generated on county level; organized by year, county, property owners' last name; information about real estate and personal property (such as acreages, city and town lots, Negroes, and livestock).	Yes	Yes	Yes	Yes	Usually not feasible; dependent on legal abstract.	Yes
Decennial Censuses (Population/Free)	CAH SAPL TC TSLAC	Federal censuses, 1850-1930, that enumerate on county and household levels; genealogical, economic, educational, health, neighborhood information.	Yes	Yes	Yes	Yes	Usually not feasible; dependent on legal abstract.	Yes
Decennial Censuses (Population/Slave)	SAPL TSLAC	Federal censuses, 1850-1860, that enumerate on county, owner, and slave levels; limited genealogical, cultural, economic, architectural information.	Not specified	Not specified	Not specified	Not specified	Usually not feasible; dependent on legal abstract.	Yes
Decennial Censuses (Nonpopulation/Agri.)	TSLAC	Federal censuses, 1850-1870, that enumerate on county and household levels; detailed information about agricultural unit production, types of improved and unimproved acreages.	Yes	Yes	Yes	Yes	Usually not feasible; dependent on legal abstract.	Yes
County Records	[See county seat]	County-level records (deed, probate, court, tax, etc.).	Yes	Yes	Yes	Yes	No	Yes

¹ CAH=Dolph Briscoe Center for American History at The University of Texas at Austin; CML=Cushing Memorial Library and Archives, Texas A&M University; SAPL=San Antonio Public Library; TC=Texas Collection at Baylor University; TDA=Texas Department of Agriculture; THC=Texas Historical Commission; TSLAC=Texas State Library and Archives Commission.

**Agricultural Theme Study for Central Texas
Research Guide and Methodology**

Table 2-1. Summary of Chapters 1 through 4.

Source	Repository	Description of Source	Pertinent Agricultural Information				Useful for Reconnaissance-Level Surveys	Property-Specific Research Assists Use
			Ranching	Stock Farming	Farming	Dairying		
Archival Collections: Texas Planning Board	TSLAC	1890-1935 federal census-based; presents agricultural data in text, chart, and cartographic formats; supplies overviews of production trends on county and state levels.	Yes	Yes	Yes	Yes	Yes	No
Archival Collections: History of Grazing	CAH	1830s-1940s summaries of ranching history; biographical, technical, economic, and other topics identified; "ranch," "stock farm," and "crop farm" defined.	Yes	Yes	Yes	No	Yes	No
Archival Collections: Company Records	CAH TC	Generated by specific companies involved in agricultural production, processing, marketing.	Yes	Yes	Yes	Yes	Limited	Yes
Archival Collections: Family Records	CAH TC	Generated by families and individuals involved in agricultural production; imbedded data vary in detail and usefulness and usually supplement census and other official records.	Yes	Yes	Yes	?	Usually not feasible; dependent on legal abstract.	Yes
Archival Collections: Oral Histories	CML TC [may be collected in the field by historians]	Mostly twentieth century; individual memoirs providing family-level data; some focus on themes, such as agricultural programs.	Yes	Yes	Yes	Yes	Limited	Yes
Archival Collections: Scrapbooks	CAH TC	Mostly twentieth century; organized by topic, county, family, etc.	Yes	Yes	Yes	Yes	Yes	No

**Agricultural Theme Study for Central Texas
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Table 2-1. Summary of Chapters 1 through 4.

Source	Repository	Description of Source	Pertinent Agricultural Information				Useful for Reconnaissance-Level Surveys	Property-Specific Research Assists Use
			Ranching	Stock Farming	Farming	Dairying		
Archival Collections: Photos	CAH CML TSLAC	Late nineteenth through twentieth centuries; “snapshot in time” of specific buildings and broader landscapes.	Yes	Yes	Yes	Yes	Yes	Yes
Archival Collections: Vertical Files	CAH TC	Mostly twentieth century; organized by topic and inclusive of a broader range of information sources than Scrapbooks.	Yes	Yes	Yes	Yes	Yes	No
Archival Collections: News-papers	CAH, TC	1830s-current; generated on local level; special editions particularly useful; some larger newspapers published special-interest sections pertinent to agriculture.	Yes	Yes	Yes	Yes	Yes	Yes
Archival Collections: Periodicals	CAH CML TC	Mostly 1880s-current; usually broader geographic focus than newspapers, but often focused on a particular aspect of agriculture.	Yes	Yes	Yes	Yes	Limited	No
Archival Collections: Government Programs	CML TDA THC	Mostly twentieth century; often field-level data in a variety of formats; frequently generated by specialists in a particular area, such as agricultural agents, architectural historians, etc.	Yes	Yes	Yes	Yes	Yes	No

COUNTY TAX ROLLS

San Antonio Public Library, Texas State Library and Archives Commission

DESCRIPTION

County tax rolls (*Figure 2-42*) were generated on a county-level by the assessor and collector and reported to the State of Texas beginning on or about the year of county formation. They are organized first, by year; second, by county; and third, by the last name of the property owner, unlike county-level tax abstracts, which are organized by the abstract number.

Columns of figures provide information about real (real estate) and personal property, including amounts and values (*Figure 2-43*). Real property is divided into Land (usually including the GLO-assigned abstract and/or certificate number associated with the grant, the numbers of acres owned, the name of the original grantee, the total size of the grant from which the specific tract was taken, and the name of the watershed on which the land is located), and Town Lots (usually including the number of the lot and block and the name of the town).

Categories of personal property (amounts and values) included Negroes (through 1865) and various categories of livestock that varied over time and commonly included horses, cattle, sheep, goats, and swine. Livestock were specifically enumerated until 1913, after which they were not recorded in the assessment rolls. Personal property categories also included money at interest, merchandise on hand, and miscellaneous property, which occasionally signified specific agricultural activities.

ASSETS

Tax rolls provide yearly property-specific data about improvements (*Figure 2-44*), numbers of livestock, and agricultural trends until the early twentieth century. In addition, rolls are the only yearly household-level records that exist apart from diaries and other owner-generated reports.

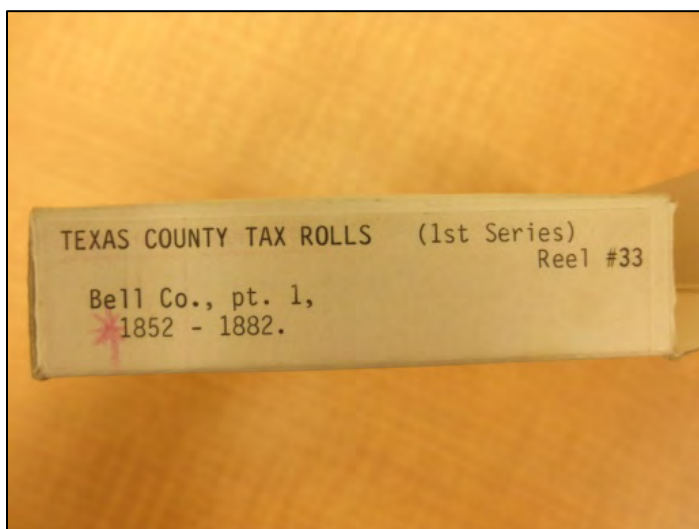


Figure 2-42. County tax rolls (Texas State Library and Archives Commission).

Agricultural Theme Study for Central Texas Research Guide and Methodology

Tract	Owner	Value	Other
120	Robertson E.S.C.	507	
304	Robertson William	520	
305	Robertson W.	1125	
306	Robertson W.	5425	
307	Robertson W.	1725	
308	Robertson W.	6558	
309	Robertson W.	1514	
310	Robertson W.	1476	
311	Robertson W.	1124	
312	Robertson W.	418	
313	Robertson W.	177	
314	Robertson W.	177	
315	Robertson W.	177	
316	Robertson W.	177	
317	Robertson W.	177	
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395	Robertson W.	177	
396	Robertson W.	177	
397	Robertson W.	177	
398	Robertson W.	177	
399	Robertson W.	177	
400	Robertson W.	177	

Figure 2-43. In 1860, E. S. C. Robertson was taxed for 14 tracts of land in Bell County, 12 Negroes, 17 horses, 100 head of cattle, and 700 head of sheep. Bell County tax roll, Texas State Library and Archives Commission.



Figure 2-44. By 1860, E.S.C. Robertson had largely completed his two-story frame plantation house (left) and stone slave quarters (right).

LIMITATIONS

Tax rolls consist of self-reported numbers only through the first decade of the twentieth century. As a result, the record is incomplete, and its accuracy may be questionable.

APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS

Unless the reconnaissance-level survey includes compilation of individual property-level legal abstracts, researchers will not find it possible to use tax records reliably.

APPLICABILITY TO INTENSIVE-LEVEL SURVEYS

Intensive-level surveys that include compilation of legal abstracts can use tax records to identify years when property was improved, whether or not the owner lived on rural acreage or in town, the kinds of livestock raised and the possible identity of associated property types, presence or absence

of slaves and associated property types, and changes in the sizes of total land holdings that might have impacted the scale of the associated agricultural landscape.

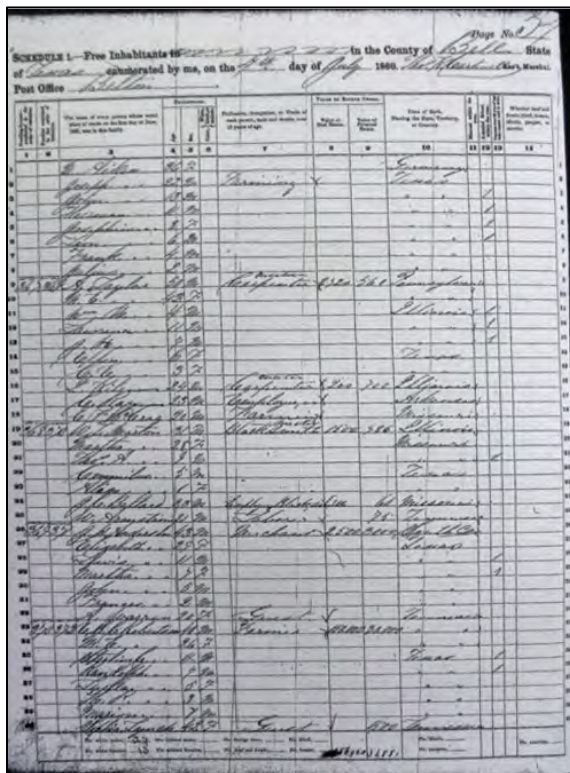
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DECENNIAL CENSUSES (POPULATION/FREE)

San Antonio Public Library, Texas State Library and Archives Commission

DESCRIPTION

U.S. federal censuses (*Figure 2-45*) are available for Texas on a county level from 1850-1930 both in microfilm format and online through databases offered by the Texas State Library and Archives Commission through the TexShare program. Censuses are organized first, by year; second, by county; and third, by the community or enumeration district. Households usually are listed in rough order by location in the enumeration district, making it possible to reconstruct neighborhoods in some cases. Within a single household, the head is listed first, followed by family members. Wives, where present, are listed next, then children, grandchildren, family members such as mothers-in-law, and non-family members such as boarders and employees. Statistics provided for each individual became increasingly detailed over time, but basic information included age, sex, color, occupation, place of birth (including, later, those of parents), whether the individual attended school, whether the head of household owned or rented the property where the family was living, and an indication of infirmity, where it existed. Beginning in about 1880, census takers sometimes wrote the names of communities in the margins of the census sheets.



Schedule 1 - Free Inhabitants		Enumerated by me, on the 1st day of July 1860		Post Office		State	
No.	Name	Age	Sex	Color	Occupation	Birthplace	Value of Assets
1	E. S. C. Robertson	30	M	W	Farmer	Virginia	10000
2	John	25	M	W	Farmer	Virginia	10000
3	Mary	25	F	W	Farmer	Virginia	10000
4	William	15	M	W	Farmer	Virginia	10000
5	Elizabeth	12	F	W	Farmer	Virginia	10000
6	John	10	M	W	Farmer	Virginia	10000
7	Mary	8	F	W	Farmer	Virginia	10000
8	William	5	M	W	Farmer	Virginia	10000
9	Elizabeth	3	F	W	Farmer	Virginia	10000
10	John	1	M	W	Farmer	Virginia	10000
11	Mary	1	F	W	Farmer	Virginia	10000
12	William	1	M	W	Farmer	Virginia	10000
13	Elizabeth	1	F	W	Farmer	Virginia	10000
14	John	1	M	W	Farmer	Virginia	10000
15	Mary	1	F	W	Farmer	Virginia	10000
16	William	1	M	W	Farmer	Virginia	10000
17	Elizabeth	1	F	W	Farmer	Virginia	10000
18	John	1	M	W	Farmer	Virginia	10000
19	Mary	1	F	W	Farmer	Virginia	10000
20	William	1	M	W	Farmer	Virginia	10000
21	Elizabeth	1	F	W	Farmer	Virginia	10000
22	John	1	M	W	Farmer	Virginia	10000
23	Mary	1	F	W	Farmer	Virginia	10000
24	William	1	M	W	Farmer	Virginia	10000
25	Elizabeth	1	F	W	Farmer	Virginia	10000
26	John	1	M	W	Farmer	Virginia	10000
27	Mary	1	F	W	Farmer	Virginia	10000
28	William	1	M	W	Farmer	Virginia	10000
29	Elizabeth	1	F	W	Farmer	Virginia	10000
30	John	1	M	W	Farmer	Virginia	10000
31	Mary	1	F	W	Farmer	Virginia	10000
32	William	1	M	W	Farmer	Virginia	10000
33	Elizabeth	1	F	W	Farmer	Virginia	10000
34	John	1	M	W	Farmer	Virginia	10000
35	Mary	1	F	W	Farmer	Virginia	10000
36	William	1	M	W	Farmer	Virginia	10000
37	Elizabeth	1	F	W	Farmer	Virginia	10000
38	John	1	M	W	Farmer	Virginia	10000
39	Mary	1	F	W	Farmer	Virginia	10000
40	William	1	M	W	Farmer	Virginia	10000
41	Elizabeth	1	F	W	Farmer	Virginia	10000
42	John	1	M	W	Farmer	Virginia	10000
43	Mary	1	F	W	Farmer	Virginia	10000
44	William	1	M	W	Farmer	Virginia	10000
45	Elizabeth	1	F	W	Farmer	Virginia	10000
46	John	1	M	W	Farmer	Virginia	10000
47	Mary	1	F	W	Farmer	Virginia	10000
48	William	1	M	W	Farmer	Virginia	10000
49	Elizabeth	1	F	W	Farmer	Virginia	10000
50	John	1	M	W	Farmer	Virginia	10000

Figure 2-45. U.S. federal census (free). A page from the 1860 federal census for Bell County provides information about E. S. C. Robertson and his family, including their ages, occupations, birthplaces, and the value of their assets (Texas State Library and Archives Commission).

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► ASSETS

As with tax records, federal population census records provide a household-level snapshot of family units whose association with agricultural activities and specific ethnic and racial groups is documented. They provide personal information about family members that can be used to supplement and assess data from other sources.

► LIMITATIONS

Although households occasionally were missed by census takers, there are no other limitations to federal population census records.

► APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS

Unless the reconnaissance-level survey includes compilation of individual property-level legal abstracts, researchers will not find it possible to use federal population census records reliably, except in efforts to reconstruct demographic information on a community or county level.

► APPLICABILITY TO INTENSIVE-LEVEL SURVEYS

Intensive-level surveys that include compilation of legal abstracts can use federal population census records to supplement information from other records; to identify descendants and facilitate contact with them; to assess the existence, extent, and distribution of ethnic and racial groups; and to anticipate the presence of associated property types.

► **LIMITATIONS**

Because slaves were used extensively in the raising of livestock as well in farming, slave schedules are not specific about the nature of the agricultural enterprise.

► **APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS**

Unless the reconnaissance-level survey includes compilation of individual property-level legal abstracts, researchers will not find it possible to use slave schedules reliably.

► **APPLICABILITY TO INTENSIVE-LEVEL SURVEYS**

Intensive-level surveys that include compilation of legal abstracts can use slave schedules to help identify the scale of agricultural enterprise and the presence or absence of specific property types, such as slave housing.

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► LIMITATIONS

Agricultural censuses cover a limited range of years (1850-1880). There are no other equivalent records for the period prior to 1850 or after 1880, apart from the less-detailed county tax records.

► APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS

Unless the reconnaissance-level survey includes compilation of individual property-level legal abstracts, researchers will not find it possible to use agricultural censuses reliably. On the other hand, they may provide county-level contextual information that could be used to supplement the records of the Texas Planning Board that are based on records that began in 1890.

► APPLICABILITY TO INTENSIVE-LEVEL SURVEYS

Intensive-level surveys that include compilation of legal abstracts can use agricultural schedules to help identify the scale of agricultural enterprise and the likely presence or absence of property types, such as specific outbuildings associated with certain types of livestock and crops.

COUNTY RECORDS

DESCRIPTION

County records are fundamental to accurately identifying and understanding historic cultural properties. They provide verifiable information against which other data can be judged and assessed. They provide clues to relationships, values, personalities, and genealogies that may be difficult to sort out otherwise (*Figure 2-48*); potential informants; important family collections not in archives; and patterns of land ownership and use. Without the data embedded in county records, other primary sources such as tax and census records lose much of their usefulness.

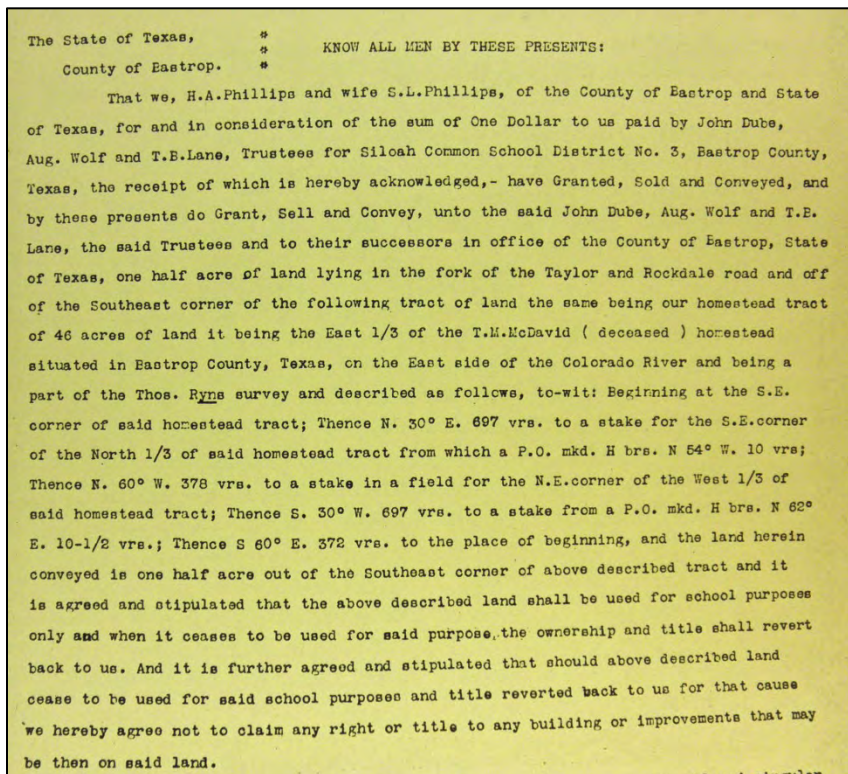
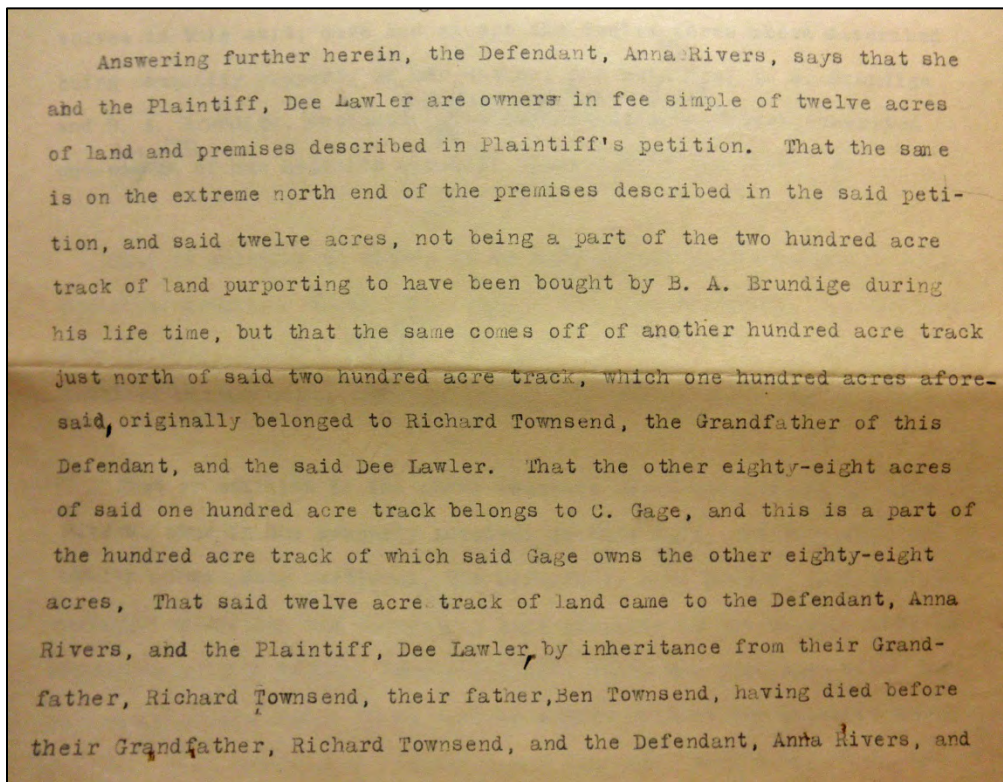


Figure 2-48. A deed record dated 1912 describes the transfer of a half-acre that was to be used for a school in Bastrop County. The record includes information about the location and adjacent roads; the names listed in the document likely identify members of the surrounding community that would use the school. Bastrop County Deed Record 52, p. 249.

ASSETS

County records can be used to create the skeleton for all other research. They are among the most accurate historic records available to historians, and in most counties, they are the most complete and span the greatest amount of time. As a result, they are a way of assessing the accuracy of other primary and secondary sources more commonly used by historians. Some county record types, such as district court case files (*Figure 2-49*), contain information that is not available in any other kind of record.

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Answering further herein, the Defendant, Anna Rivers, says that she and the Plaintiff, Dee Lawler are owners in fee simple of twelve acres of land and premises described in Plaintiff's petition. That the same is on the extreme north end of the premises described in the said petition, and said twelve acres, not being a part of the two hundred acre track of land purporting to have been bought by B. A. Brundige during his life time, but that the same comes off of another hundred acre track just north of said two hundred acre track, which one hundred acres afore-said, originally belonged to Richard Townsend, the Grandfather of this Defendant, and the said Dee Lawler. That the other eighty-eight acres of said one hundred acre track belongs to C. Gage, and this is a part of the hundred acre track of which said Gage owns the other eighty-eight acres. That said twelve acre track of land came to the Defendant, Anna Rivers, and the Plaintiff, Dee Lawler, by inheritance from their Grandfather, Richard Townsend, their father, Ben Townsend, having died before their Grandfather, Richard Townsend, and the Defendant, Anna Rivers, and

Figure 2-49. A district court case not only gives information about a suit concerning land in Bastrop County but also provides details about family members, their relationships, and their claims to specific parcels that might be time-consuming to find in any other records, including federal censuses and deeds. Bastrop County District Court Case File No. 7514.

► LIMITATIONS

There are no limitations to county records, except in cases where they have been destroyed.

► APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS

Deed and many other country records require a level of detailed research that may not be possible to undertake during reconnaissance-level surveys. Tax plats and other maps that depict ownership on a county-wide basis may be helpful in understanding the development of historic landscapes.

► APPLICABILITY TO INTENSIVE-LEVEL SURVEYS

County records are basic to understanding the histories of individual properties and larger landscapes. They make it possible to use other more commonly used records, such as tax records, censuses, and secondary sources with a degree of confidence, and they often point the way to identification of other useful records.

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ARCHIVAL COLLECTIONS: TEXAS PLANNING BOARD RECORDS: AGRICULTURAL PRODUCTS OF TEXAS

Texas State Library and Archives Commission

DESCRIPTION

Using census records from 1890 to 1935, the Texas Planning Board compiled five volumes of data about the 50 leading farm products of Texas based on the U.S. census. Each of the volumes focused on a particular aspect of agricultural production: Livestock (Volume I), Livestock Products (Volume II), Cotton and Major Feed Crops (Volume III), Minor Feed Crops, Sweet Potatoes, Irish Potatoes, Onions and Tobacco (IV), and Orchard Fruits, Berries, and Pecans (V). Volume I included data about horses, mules, cattle, sheep, goats, swine, chickens, turkeys, ducks, and geese.

The study dealt with each agricultural product separately for every census year and presented the data from three different perspectives. First, a text provided a brief history of product growth and development or decline; second, a complete chart (*Figure 2-50*) was given that showed amounts of each product by county for the state; and third, colored maps (*Figures 2-51 and 2-52*) showed production by counties for each reporting year and illustrated production trends throughout the state in five- or 10-year increments.

TEXAS: COTTON							
Production by Counties Computed by Census Years							
County	1890	1900	1910	1920	1925	1930	1935
	Bales	Bales	Bales	Bales	Bales	Bales	Bales
Anderson	10,241	16,950	13,685	11,272	20,768	19,268	9,762
Andrews	----	----	----	----	73	340	30
Angelina	2,232	5,354	2,390	1,849	5,861	8,533	7,067
Arenasas	5	42	21	42	80	1,482	385
Archer	78	377	4,035	5,042	5,011	2,334	937
Armstrong	----	4	----	115	2,066	1,047	333
Atascosa	5,208	3,799	4,799	4,960	15,329	11,670	7,106
Austin	17,301	26,087	14,112	6,083	23,258	9,676	15,762
Bailey	----	----	----	----	2,949	10,228	4,693
Bandera	470	1,251	638	489	324	24	50
Bastrop	26,292	41,730	18,013	13,882	27,931	12,342	13,300
Baylor	24	602	8,487	14,520	18,978	6,873	3,020
Bee	603	4,340	7,143	3,869	13,858	15,744	8,940
Bell	37,473	56,560	58,050	49,112	73,202	57,574	42,497
Bexar	10,621	10,329	14,329	10,526	26,142	7,893	9,543
Blanco	3,761	3,921	2,729	5,057	4,896	510	1,273
Borden	----	32	178	1,412	5,893	1,650	49
Bosque	11,226	12,193	13,391	18,386	22,356	12,362	7,367
Bowie	8,693	15,753	13,631	21,841	27,515	30,520	15,597
Brazoria	7,969	5,923	578	4,037	9,428	5,444	7,341
Brazos	16,923	19,011	21,453	8,177	20,089	12,743	12,847
Brewster	----	----	----	----	130	206	52
Briscoe	----	1	586	3,658	10,488	7,982	1,236
Brooks	*	*	*	2,507	3,697	7,661	2,510
Brown	6,931	11,638	12,710	21,866	17,678	8,012	6,269
Burleson	16,062	25,242	18,694	5,693	25,678	18,605	19,020
Burnet	8,666	6,937	5,612	11,590	13,475	9,542	3,955
Caldwell	21,326	42,660	35,773	21,857	48,569	11,878	22,825
Callahan	51	1,185	1,159	2,702	6,238	5,974	3,780
Callahan	2,871	7,640	13,022	12,486	16,773	6,481	5,792

Figure 2-50. Charts such as this provided detailed data based on census records for crops and livestock between 1890 and 1935. Folder 10-21, Box 017-10, Texas Planning Board, Texas State Library and Archives Commission, Austin.

Agricultural Theme Study for Central Texas Research Guide and Methodology

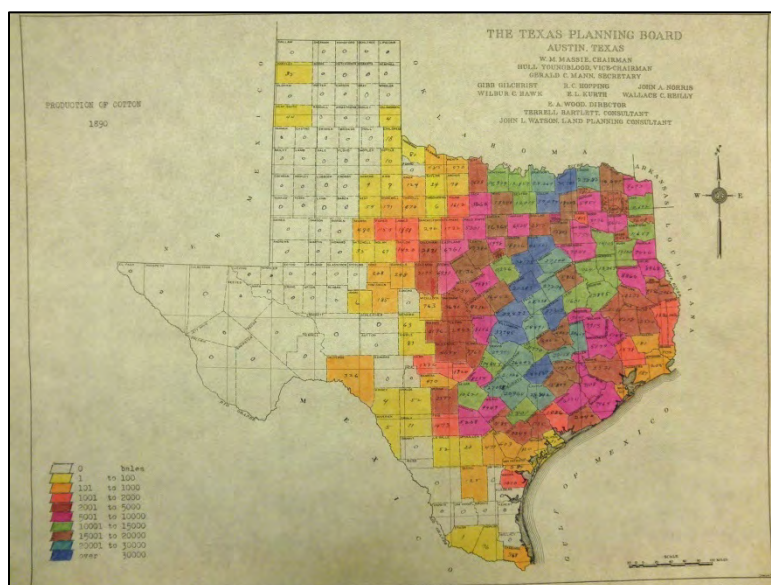


Figure 2-51. This map produced by the Texas Planning Board depicted the extent of cotton cultivation in Texas in 1890 and the numbers of bales harvested by county. Folder 19, Box 017-36, Texas Planning Board, Texas State Library and Archives Commission, Austin.

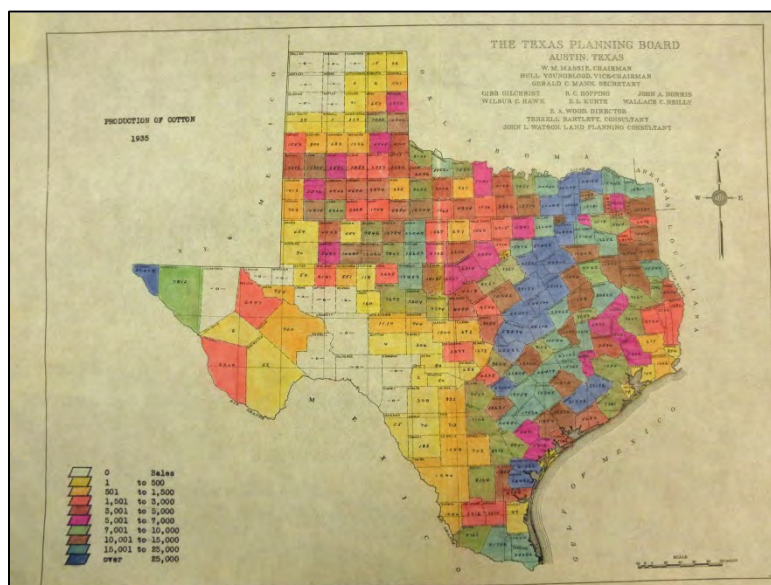


Figure 2-52. A map produced by the Texas Planning Board in 1925 graphically depicts the spread of cotton in Texas. Folder 19, Box 017-36, Texas Planning Board, Texas State Library and Archives Commission, Austin.

ASSETS

The Planning Board records provide a general overview in narrative form of production trends on a statewide basis over a 45-year span of time that represents one of the periods of greatest agricultural production in Texas. The text identifies events that influenced those trends and provides numerical data in tabular form. The records also depict the statistical data in a visual format that allows the researcher to readily grasp trends on county, regional, and state levels. Inclusion of

statistics from 1925 and 1935 provide a more-nuanced record of Texas agriculture than that provided by studies that use only the decennial censuses.

► **LIMITATIONS²**

The records end in 1935. As a result, the important periods of agricultural production during World War II and the 1950s, as well as a record of the impacts of increasing mechanization, are not represented in the data. In addition, some of the records depict a snapshot in time rather than a historical range of activities and agricultural trends, thus limiting their relevance to studies that seek to understand decades-long patterns.

► **APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS**

The textual portion of the Planning Board records provides general contextual information about 50 agricultural products during a period that is widely represented in agricultural architecture and landscapes. The maps inform researchers about historical trends on a county, regional, and state-wide basis, and they give clues about the likelihood of encountering specific property types that are associated with types of livestock and crops. They also suggest to the researcher the dynamic quality of the agricultural landscape over time, as different activities occurred in the same geographical area.

► **APPLICABILITY TO INTENSIVE-LEVEL SURVEYS**

The county- and regional-level data in the records provide a historic context for property-specific research based on deed and tax records, oral histories, and local archival research.

² An apparent drawback—lack of statistical data for livestock prior to 1890—is mitigated by the fact that reliable statistics for numbers of free-range animals were not available in much of Texas prior to 1880.

ARCHIVAL COLLECTIONS: GRAZING INDUSTRY PAPERS

Dolph Briscoe Center for American History at The University of Texas at Austin

DESCRIPTION

The Grazing Industry Papers is one of numerous archival collections that focuses on one or more aspects of agriculture (*Figure 2-53*). Several volumes within the History are particularly noteworthy. The first is *The Westward Movement*, which draws on maps, published books, historic newspapers, census records, almanacs, and other primary and secondary sources to present a history of early exploration and trails used by later cattle drives, the first herds and ranchers, development of markets, the roles of the military as facilitators of the spread of ranching and as consumers of Texas beef, and the impact of the Civil War on the cattle industry. A *Calendar of the Trail* by T. U. Taylor provides a helpful chronology of the industry's history from 1838-1865 and highlights the role of James Monroe "Doc" Day of Hays County in initiating the earliest trail drives north.

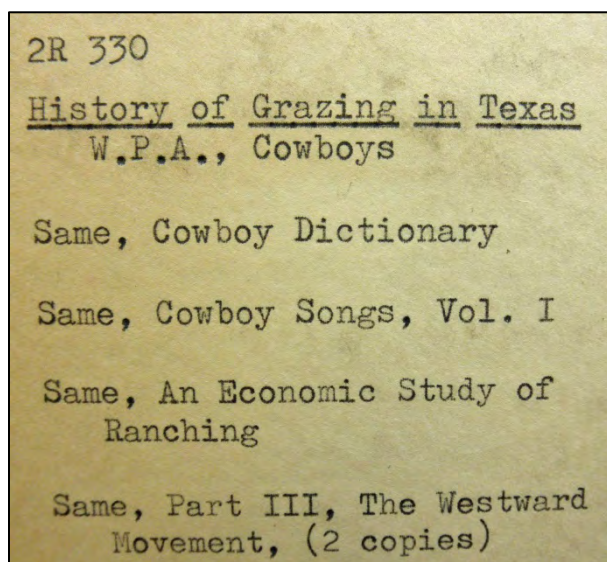


Figure 2-53. The label on a box containing a small portion of the Grazing Industry Papers suggests some of the many topics covered in the collection. Box 2R330, Dolph Briscoe Center for American History, The University of Texas at Austin.

A second volume, titled *An Economic Study of Ranching*, is a replication of a doctoral dissertation completed by Bonney Youngblood in 1921. The study is an analysis of the various phases of the ranching business with the intent of applying the same level of analysis to the raising of livestock as that typically given to farming. It provides helpful definitions of the terms "ranch," "crop farm," and "stock farm" and discusses the extent to which data recorded in censuses have failed to distinguish among the three types of agricultural units. In this respect, it highlights the problem of accurate and consistent definitions that are pervasive in and underlie statistics provided in federal censuses, as well as the importance of surveyors' being able to distinguish among the three types of enterprises when conducting reconnaissance- and intensive-level surveys.

Agricultural Theme Study for Central Texas Research Guide and Methodology

Two additional volumes are entitled *The History of Grazing in Texas* and cover the period 1866-1886 and 1886 to World War I (Figures 2-54 and 2-55). Both volumes consist of individual articles that originally were published in journals such as *Texas Livestock Journal*, *Farm and Ranch*, *Southwestern Historical and Political Science Quarterly*, *Journal of Economic and Business History*, and *The Cattleman*; newspapers such as *The Dallas Morning News*, *Amarillo News and Globe*, *San Antonio Express*, *Nueces County Gazette*, *Nueces Valley Weekly*, *Houston Post*, *Corpus Christi Caller*, and *Galveston Daily News*; books; and oral history interviews. The volumes cover such topics as a general history of ranching; the economics of ranching and mores on the range; and the impacts of inventions (such as barbed wire) and developments in rail transportation, water resources, and cattlemen's organizations. Within the text are specific discussions of such topics as varieties of fencing (rock, brush, rail, pole, board, smooth wire, and barbed wire in the vicinity of San Antonio and Bexar County), the impacts of state legislation on the ranching industry, the effects of weather (drought and extreme cold), the impacts of the introduction of sheep to Texas and the structure of that particular part of the ranching industry, and breeds of sheep with specific descriptions of each.

TABLE 30
Nutrition Requirements of Different Types and Classes of Livestock

Type of Animal	Class	Average of Estimated Heights at end of Period (Pounds)	Estimated Increase in Weight During Period (Pounds)	Age at Time of Sale (Months)	Period of Growth and Maintenance	Pounds of Dry Matter Required. (Grass' Estimates)	Per Cent. of Carrying Capacity Required Considering the Other Cows as Units (Grass' Ratio)
Cattle	(Bulls)	1200	0	72-120	1 year	6965	1.25
	(Mother Cows)	750	75	36-144	1 year	5571	1.00
	(Dry Cows)	750	0	72-144	1 year	5152	.92
	(Calves)	350	225	9	9 mos.	3260	.58
	(Yearling Heifers)	550	200	12-24	1 year	4354	.77
	(Two-Year-Old Heifers)	700	150	33	1 year	5800	1.04
	(One-Year-Old Steers)	600	250	21	1 year	5371	.96
	(Two-Year-Old Steers)	750	150	33	1 year	5934	1.06
	(Three-Year-Old Steers)	850	100	45	1 year	6360	1.14
	(Bulls)	125	0	36-72	1 year	949	.17
Sheep	(Dewes)	95	10	24-72	1 year	849	.15
	(Lambs)	55	47	7	7 mos.	480	.08
	(Yearling Rams)	90	45	14	7 mos.	620	.11
	(Yearling Wethers)	90	45	14	7 mos.	577	.11
	(Wethers)	100	10	26	1 year	577	.16
Goats	(Bucks)	100	0	36-64	1 year	825	.15
	(Does)	60	8	36-64	1 year	747	.13
	(Kids)	40	24	7	7 mos.	294	.05
	(Yearling Does)	60	40	14	7 mos.	571	.10
	(Wethers)	85	45	14	7 mos.	554	.12 67

66 Notes computed by Dr. G.S. Fraze, Chief, Division of Chemistry; State Chemist; Texas Agricultural Experiment Station, Agricultural and Mechanical College of Texas, College Station, Texas.
67 Sheep and goats may be converted into cattle equivalents by multiplying the number in each class by the corresponding ratio. For example: 100 ewes X .15=15 cattle equivalents; which is to say that 100 ewes consume as much range forage as 15 mother cows, and so forth.

The Carrying Capacity of the Ranges

Figure 2-54. A table depicting nutrition requirements for cattle, sheep, and goats provides information that is helpful to historians seeking information about the acreage needed for the operation of ranches. Box 2R330, Dolph Briscoe Center for American History, The University of Texas at Austin.

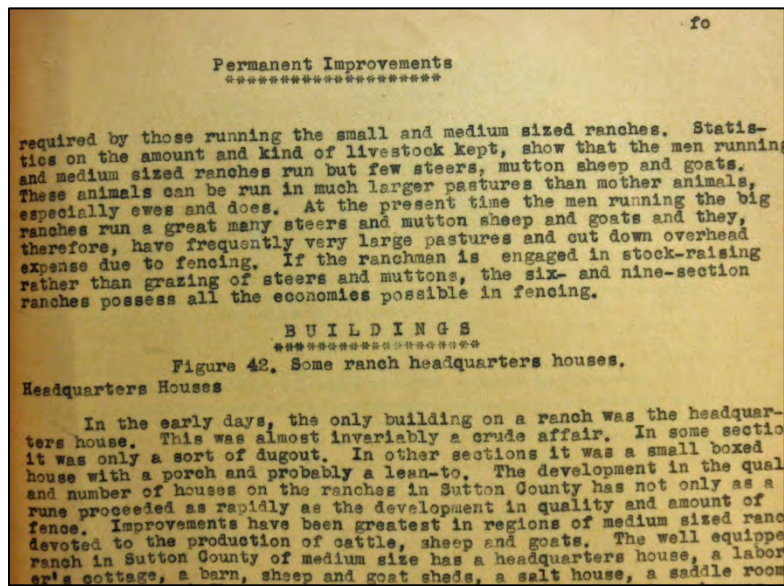


Figure 2-55. The article depicted here provides detailed information about typical ranch improvements that would help historians identify building functions. Box 2R330, Dolph Briscoe Center for American History, The University of Texas at Austin.

ASSETS

The primary assets of the History of Grazing in Texas collection are: the collection replicates difficult-to-access materials that often are located in repositories outside of Austin and at universities outside of the state; the typewritten volumes focus on specific topics that are treated in a scholarly manner; the volumes pull together numerous primary and secondary sources and present them in a readable text that focuses on most aspects of the ranching industry and provides an accurate overview history; in some cases, the authors identify, discuss, and analyze topics that are important to consider when surveying individual ranch-related buildings and complexes as well as historic ranching landscapes.

LIMITATIONS

Much of the information that is site- or locally specific (usually data derived from newspapers and interviews with historical figures) is embedded in the texts in such a way that access is time-consuming. The chronological focus of the collection ends in the 1930s, and there is no equivalent collection that presents information in a similar format for the balance of the twentieth century.

APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS

The History of Grazing collection—particularly the volumes that provide an overview of the history of ranching relative to cattle, sheep, and goats—includes detailed, in-depth chronologies based on a wide range of primary and secondary sources. Historians should be aware of the discussion of ranch, farm, and stock farm types of endeavors and the characteristics of each, not only as they might appear during survey but also as they are defined in U.S. agricultural censuses over time.

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APPLICABILITY TO INTENSIVE-LEVEL SURVEYS

Volumes in the History of Grazing collection include difficult-to-access, site- or property-specific information taken from historic newspapers and interviews. An interview with William B. Krempkau in San Antonio (1940), for example, enumerated and described fence types northwest of San Antonio and fence builders by name, as well as the locations of the fences.

ARCHIVAL COLLECTIONS: COMPANY RECORDS³

Dolph Briscoe Center for American History at The University of Texas at Austin, Texas Collection at Baylor University

DESCRIPTION

Company records such as the Alliance Gin Records document the formation and operations of commercial entities closely involved in agricultural work. In this case, a book of records was generated by a company located in Buda, Hays County. They describe activities at the gin in the fall of 1890, with information about the length of the season, individual growers, pounds ginned, and payments made. A second part of the book is comprised of the original and revised bylaws of the Buda Cooperative Milling, Ginning & Mercantile Association of the Farmers Alliance; a list of shareholders; and meeting minutes for various dates from 1892 to 1915. The record also includes a listing of gin equipment purchased in 1910 from Walter Tips of Austin (*Figure 2-56*).

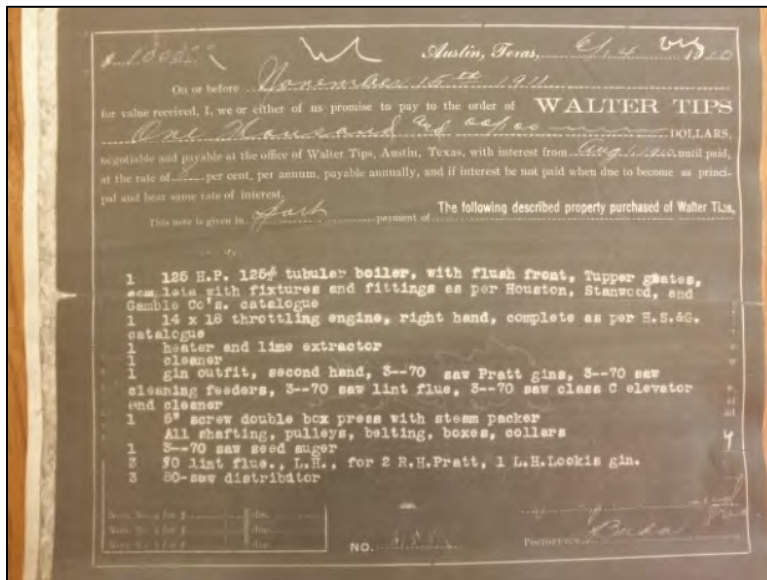


Figure 2-56. The company records of the Alliance Gin in Hays County are helpful on a number of levels. The equipment list highlights the role of a prominent Austin manufacturer in regional cotton trade during the early twentieth century, when cotton cultivation in the study area was a vigorous agricultural activity. Box 2A136, Dolph Briscoe Center for American History, The University of Texas at Austin.

ASSETS

Company records can be a source of information about agricultural equipment and individuals in a community who were involved in the production of a specific crop, such as cotton. They may provide support for statements of significance about important local residents and, if the chronological range of the records is sufficiently broad, the data may provide clues about changing

³ Another rich source of information about companies associated with agricultural endeavors is located in the Corporations Division of the Secretary of State.

local agricultural conditions. Identification of non-local providers gives clues about the geographic range of economic connections.

► **LIMITATIONS**

Use of a business record to associate specific named individuals with properties identified during a survey is limited. If the business record has a limited chronological range, its value in identifying agricultural trends also is limited.

► **APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS**

Business records associated with specific agricultural activities may help surveyors anticipate associated property types. They also may provide clues about the character of agricultural landscapes that once existed and tools to assess the extent to which those landscapes have changed.

► **APPLICABILITY TO INTENSIVE-LEVEL SURVEYS**

Archival documents such as business records may identify individuals who were involved in a particular agricultural activity and aid in assessments of their significance. Documents related to specific industrial sites assist in developing histories of those sites and may provide information about the degree of change those sites have experienced.

ARCHIVAL COLLECTIONS: FAMILY RECORDS

(Diary of Michael Erskine, Fred Acree Papers, Gladys Allen Papers, Matthew Dawson Anderson Papers, Carter-Harrison Family Papers, Caufield Family Papers, Ralph Edward Conger and George Harvey Randle Ledgers, Mamie Stewart Diaries)

Dolph Briscoe Center for American History at The University of Texas at Austin, Texas
Collection at Baylor University

DESCRIPTION

A selection of diaries, correspondence, bills and receipts, and ledgers within family papers record events from the mid-nineteenth century to the first third of the twentieth century in a variety of settings. The diary of Michael Erskine (*Figure 2-57*) records a mid-nineteenth-century cattle drive from Erskine's ranch south of the Guadalupe River in Guadalupe County to California. He records the numbers of cattle added to the herd by various owners in Guadalupe County and along the trail. Notes by Blucher H. Erskine, Sr., mention Michael Erskine's subsequent return to Capote Ranch in 1859 and his cattle drives to New Orleans in the early 1860s. They also describe Erskine's 26,000-acre ranch and cotton plantation in Guadalupe County, log slave houses, one-and-a-half-story log residence, and mill.

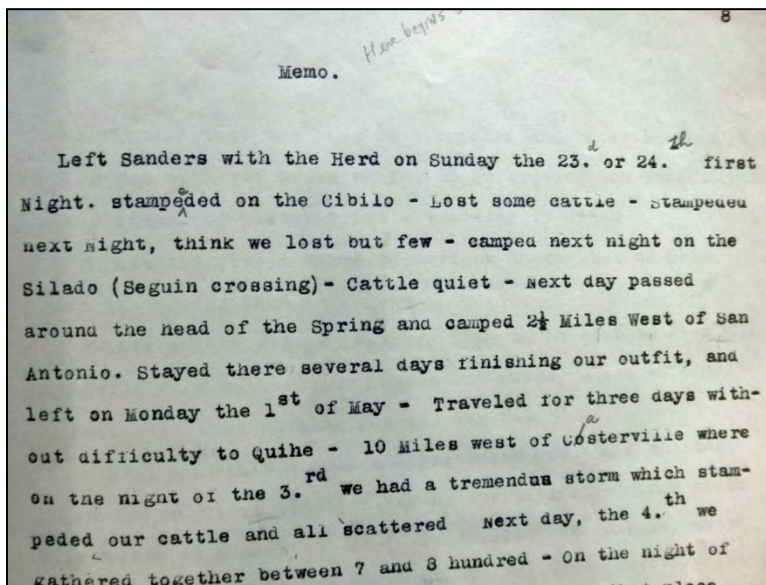


Figure 2-57. Michael Erskine's diary recorded a pre-Civil War cattle drive and landmarks along the trail from the area of Seguin to west of San Antonio and on to the vicinity of present-day Uvalde and Del Rio by way of an early military trail. Box 3N164, Dolph Briscoe Center for American History, The University of Texas at Austin.

Records kept by the Anderson family also record agricultural activities during the second half of the nineteenth century, but focus on cotton cultivation in the northeastern part of Guadalupe County. Farming and ranching activities in McLennan County during the mid-to-late nineteenth century are documented in Carter-Harrison Family Papers, Caufield Family Papers, and Randle Ledger; while the

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► ASSETS

Diaries, correspondence, and financial records may provide first-hand accounts of specific persons and places associated with particular agriculture activities in settings that range from ante- and post-bellum-era plantations and ranches to tenant farms. They may provide evidence of the practical ramifications of public policy, weather events such as droughts and floods, and changes brought about by market shifts and environmental degradation. They provide real-time information that can be used to assess the accuracy and completeness of secondary texts and fill in the chronological gaps left by data from decennial censuses.

► LIMITATIONS

Because archival collections generated by single or related family units provide a relatively narrow point of view, they should not be used as sole sources of information.

► APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS

In the absence of property-specific information based on legal abstracts, it may be difficult to identify archival records such as diaries, journals, correspondence, and ledgers that are useful to a reconnaissance-level survey. On the other hand, records such as those kept by Erskine and Anderson alert historians to the types and scales of agricultural landscapes that once existed in Guadalupe County and to agricultural activities that occurred in the areas described. Identification and description of improvements on the properties might provide clues to property types once common in the general area.

► APPLICABILITY TO INTENSIVE-LEVEL SURVEYS

Archival collections may provide real-time descriptions of buildings, structures, and agricultural landscapes associated with agricultural enterprises and aid researchers in efforts to assess the integrity of both individual properties and of historic landscapes.

ARCHIVAL COLLECTIONS: ORAL HISTORIES

Cushing Memorial Library at Texas A&M University, Texas Collection at Baylor University, Dolph Briscoe Center for American History at The University of Texas at Austin

DESCRIPTION

Oral histories preserve the first person stories of individuals who participated in specific events and whose lives were shaped by the ideas, events, people, and places of their day. They are sound recordings and, sometimes, transcriptions of interviews with people who often have been eyewitnesses to historical events. Frequently, oral histories result from targeted inquiries that focus on particular events and places, on communities, or on topics of interest to the interviewer and sponsoring entity. The information gleaned from interviews may be used to amplify or correct data available in other forms of the historical record; it also may serve as a tool to direct or redirect historical inquiry.

Many oral histories are collected at random and are not a part of every archive because of their preservation requirements. In addition, not every oral history in original format has been transcribed, making access and use inconvenient and time-consuming. On the other hand, oral histories may result from organized efforts that involve formal steps such as identification of a theme or focus for the collecting effort, a pool of interviewees, and identification of a repository for the recordings and transcriptions. Many oral histories housed by the Baylor University Institute for Oral History and by the Cushing Memorial Library and Archives, for example, have been collected as a result of specific projects, they are readily accessible, and many have been transcribed. A number of the oral histories housed at the two repositories relate to Texas agriculture broadly; one sizable collection targets the area within the western boundaries of the Blackland Prairie region and another, with a state-wide scope, includes interviews with experts in various aspects of agriculture.

The historian in the field should always take advantage of less-formal opportunities to engage potential informants who may be uniquely qualified to provide information about specific properties. Such ad hoc encounters usually involve targeted questions and may not be recorded. They should include preparation of notes summarizing the collected information. Where encounters result in a recorded product that includes valuable information, every attempt should be made to obtain appropriate releases from the interviewees.

ASSETS

Oral histories may serve as important supplements to other sources such as published texts, archival collections, maps, and photographs, all of which can be used to prompt the informant. While oral histories are limited by the age of the interviewee, the existence of memoirs as early as the 1930s means that such records may describe events as early as the late nineteenth century with some

degree of accuracy.⁴ Oral histories amplify the historic record by describing experience and expressing reflection that may convey information about values, opinions, prejudices, and personal attitudes in general. Importantly, interviewees often are sources of information about agricultural programs, buildings, structures, landmarks, and landscapes that may not be available in any other source. Often, they are the primary source of information about traditional cultural properties.

► LIMITATIONS

Both interviewer and interviewee are sources of limitations: In the one case, interviewers may skew the information presented in an oral history by asking leading questions that stem from personal biases or expectations; in the other case, interviewees may suffer from erroneous or incomplete memory. As a result, oral histories never should be used as stand-alone sources. Information embedded in them should be checked against other sources of information or used as a tool to direct or redirect research.

► APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS

Ad hoc queries to local informants in the field can be very useful during reconnaissance-level surveys because they may result in a better understanding of the development of a landscape. They also may help identify the functions, histories, and associations of specific architectural properties. If there is time allotted in a project, oral histories with experts in the agricultural field may be helpful in establishing historical contexts for survey work. However, because the information in them often is difficult to access quickly, oral histories in local or university collections generally are not applicable to reconnaissance-level surveys unless the survey includes compilation of property-level legal abstracts and identification of associated families.

► APPLICABILITY TO INTENSIVE-LEVEL SURVEYS

Oral histories such as those at Texas A&M University that pertain to the work of the Texas Agricultural Experiment Station may be very helpful to intensive-level surveys that involve properties associated with the work of the Station. Intensive-level surveys that include compilation of legal abstracts can use oral histories to provide information that supplements other historical texts. Oral histories associated with populations that are under-represented in the historical narrative may be especially valuable. Finally, identification of local informants may lead the historian to archival records still in the possession of the informant.

⁴ Interrogatories that are part of county-level district court case files are similar to oral histories because they involve a question-and-answer format and often describe historical events, people, and places. In parts of the Blackland Prairie region, such records date to the second quarter of the nineteenth century.

ARCHIVAL COLLECTIONS: SCRAPBOOKS

Dolph Briscoe Center for American History at The University of Texas at Austin, Texas Collection at Baylor University

DESCRIPTION

Scrapbooks are collections of miscellaneous papers and ephemera that are organized according to topics such as agriculture, specific crops and livestock, and counties. County scrapbooks at the Dolph Briscoe Center for American History are divided into items of general interest (history, etc.) and obituaries, which record biographical data. Scrapbooks focusing on topics usually include individual clipped articles; in other cases, entire publications are included, such as a copy of the semi-annual *Texas Co-op Review*, issued by the Texas Cotton Co-operative Association of Dallas and part of the Cotton Scrapbook. Collecting for scrapbooks ended in about the mid-twentieth century, and the preponderance of material dates from the early-to-mid twentieth century, although there are materials from the 1800s as well.

ASSETS

Scrapbooks pull together in one location a wide variety of miscellaneous records that are related only in the way they pertain to a common topic. Scrapbooks that include obituaries save researchers the trouble of looking for a specific deceased individual in multiple copies of a single newspaper when the newspaper may or may not be in the general collections. They frequently include original historic photographs of people and places, including buildings (*Figure 2-60*) that are not part of a formal photographic collection. In a few cases, they include original interviews that provide information about rural life in a particular county. Topical scrapbooks often identify and include information about individuals who were important in the field of agriculture (*Figure 2-61*) and may provide state-wide statistics about targeted crops as well as discussions about state and federal laws affecting production, marketing, and sales. In other cases, they may make note of significant agricultural trends, such as a change from cotton farming to ranching on the Blackland Prairie in the late 1930s.

LIMITATIONS

Scrapbooks are self-limiting because of their scope and volume. They are not comprehensive in any way, and the presence of useful information frequently is a function of serendipity.

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Figure 2-60. The Guadalupe County Scrapbook includes photographs such as this one of a cotton yard and Farmers' Cotton Gin at St. Hedwig. Box 3L226, Dolph Briscoe Center for American History, Austin.



Figure 2-61. A newspaper article in the Cotton Scrapbook and that dates to the 1930s describes efforts by Williamson County farmers to improve staple and grade cotton. Allegedly, their work had national significance. Box 3L142, Dolph Briscoe Center for American History, The University of Texas at Austin.

► **APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS**

Scrapbook materials that include summaries of interviews may provide general information about the history of agriculture as seen through the eyes of one family. William A. Preist, for example (see *Figure 2-19*), who was interviewed at the age of 61 in 1937, discussed the wide-spread activity of cattle raising in Guadalupe County, the prevalence of open range as late as the late nineteenth century, the self-sufficiency of the agricultural unit, the relationship of the county to San Antonio as a trade center, trail drives, and the shift of ranching westward in the late 1870s. Obituaries are less useful in reconnaissance-level surveys unless the researcher has access to individual property-level legal abstracts. Scrapbooks that target specific subjects, such as cotton, may include articles that point to the significance of a crop in a county or several communities, may draw attention to the history of associated industries, and may remark on significant changes in patterns of agricultural economies (see *Figure 2-20*).

► **APPLICABILITY TO INTENSIVE-LEVEL SURVEYS**

Scrapbook materials such as illustrated newspaper articles may provide specific information about rural communities and associated agricultural activities such as cotton ginning that may not be photographically recorded elsewhere. The combination of descriptive text and illustrations conveys a sense of unique time, space, and architectural character that is valuable to researchers who must address issues pertaining to integrity. Obituaries are useful to intensive-level surveys because they may provide contextual information about the significance and activities of individuals known to be associated with particular properties.

ARCHIVAL COLLECTIONS: PHOTOGRAPHS

Dolph Briscoe Center for American History at The University of Texas at Austin, Cushing Memorial Library at Texas A&M University, Texas State Library and Archives Commission

DESCRIPTION

The photograph is a snapshot in time of a specific rural agricultural landscape that includes natural vegetation, cultivated land, a crop, agricultural buildings, and residences. Photographs of cotton fields tentatively identified as being in Caldwell County and made in 1900 depict fields prior to harvest (*Figure 2-62*). Fencing is visible in the background. Two frame buildings, one a barn and another a house with an exterior chimney, also are visible in the background, as is a windmill and elevated water tank. A third building is present but too far in the distance to ascertain function or construction type. Cotton dominates the landscape. No other vegetation is visible with the exception of an isolated growth that may be a mesquite or other tree and a line of trees on the horizon that is barely visible in the original photograph.



Figure 2-62. Cotton Field (Center for American History).

► **ASSETS**

The details in the photograph document cotton growing in a deflated, fenced field; the degree of deflation suggests a location where cotton has been planted repeatedly, and erosion is well-established. The presence of fencing, of what appears to be a hay barn, and a windmill with water tank suggests either that the adjoining land is under separate ownership and given over to livestock, or that the operation is a mixed one of cropping and livestock production. The presence of a tree line in the distance suggests either that there is a major waterway present, which would identify the field as being in a flood plain, or that the landscape, including the field, was once wooded.

The size of the barn suggests a current or past involvement in livestock-raising on a large scale. The distance of the windmill and tank from the residence suggests that the residence may be a secondary one used by non-family members, and that a primary residential complex may be obscured by the barn. The subject of the photograph (cotton fields in bloom), the size of the photograph, and the medium (gelatin silver) are all indications of the importance of cotton culture in the early twentieth century.

► **LIMITATIONS**

Single photographs or collections that lack chronological depth can only depict a single point in time and thus have limited use when trying to assess rates and degrees of change. Because a client often is involved, and photography implies selection of view, photographs also may be used to support a particular idea, opinion, or point of view. To that extent, their effectiveness as documents of a place in time and as objective records can be compromised.

► **APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS**

Photographs that are dated and identified by location, or whose dates and places can be estimated, can be uniquely useful in establishing the appearance of a historic-age agricultural landscape. They provide details about human-induced change in the forms of land and vegetation modification, and buildings and structures. They also provide images of regional property types.

► **APPLICABILITY TO INTENSIVE-LEVEL SURVEYS**

To be used in intensive-level surveys, it is important that identifications of location and date are accurately recorded. Such photographs can be used to assess the original or early appearances of landscapes, buildings, and structures for comparison to field conditions at the time of survey. Such comparisons may contribute to more accurate assessments of integrity.

ARCHIVAL COLLECTIONS: VERTICAL FILES

Dolph Briscoe Center for American History at The University of Texas at Austin, Texas Collection at Baylor University

DESCRIPTION

Vertical files such as those about dairying and grain include materials from a wide chronological range that focus more broadly than Scrapbooks. Because they include materials published in newspapers and professional and trade journals, and by government agencies and universities, as well as ephemera from trade shows and other venues, they appear to serve a different purpose and may include information that does not exist in Scrapbooks.

ASSETS

Vertical files appear to be organized by the same topics as Scrapbooks and may supplement the materials in Scrapbooks as far as chronological range is concerned. Inclusion of journal articles, ephemera, and government and university publications provide researchers with clues about associated publications that may include helpful information about agriculture.

LIMITATIONS

Many vertical file materials are collected in a haphazard fashion. While the lucky researcher may find exactly what he's looking for, the likelihood varies and greatly depends on the subject of the vertical file.

APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS

The scope of materials in vertical files can supplement county and topical histories that form the basis of research associated with reconnaissance-level surveys. They may identify associated topics that direct a researcher to appropriate secondary sources and give clues about agricultural trends.

APPLICABILITY TO INTENSIVE-LEVEL SURVEYS

Vertical files sometimes include property-specific information that is not present in Scrapbooks and would involve time-consuming research in local newspapers. An article (*Figures 2-63 and 2-64*) from an unidentified newspaper dated April 19, 1929, for example, includes a photograph of a Williamson County landmark, the Round Rock Cheese Factory, and describes in detail the history of the factory, the investors involved in its operation, their business relationships with local milk producers, the impact of the demand for milk on the sizes and numbers of Williamson County dairy farms, and the associated impact on the relative amounts of acreage devoted to feed versus cotton.

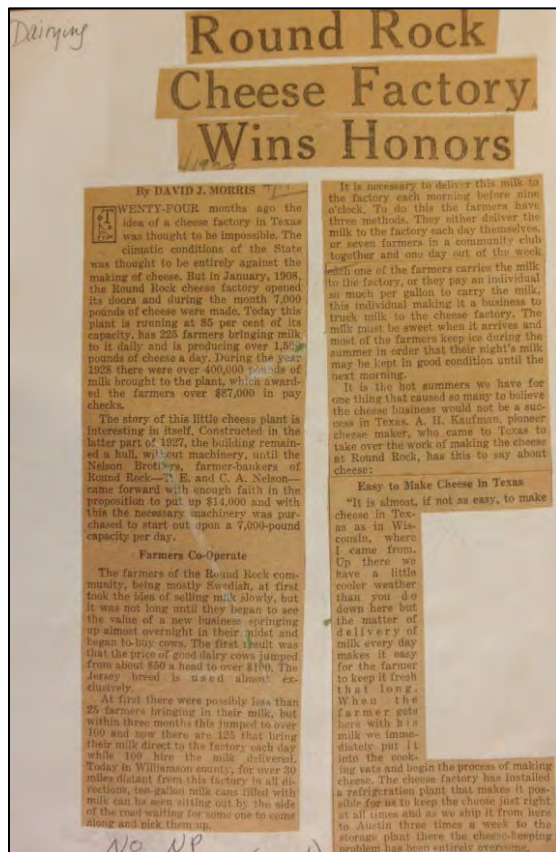


Figure 2-63. A newspaper article highlights the importance of the dairy industry in Williamson County during the 1920s. Dairying Vertical File, Dolph Briscoe Center for American History, The University of Texas at Austin.



Figure 2-64. A newspaper article depicts a new cheese factory in Round Rock. Dairying Vertical File, Dolph Briscoe Center for American History, The University of Texas at Austin.

ARCHIVAL COLLECTIONS: NEWSPAPERS

Dolph Briscoe Center for American History at The University of Texas at Austin, Texas Collection at Baylor University

DESCRIPTION

While all newspapers have the potential for value to the current project, one particular type of issue has unusual value. Within the project area, special editions were published to celebrate the Texas Centennial; 50-year and centennial histories of towns; 125th anniversaries; and specific ethnic groups, regions, and industries. Such editions exist for Austin, Bastrop, Belton, Cameron, Elgin, Gatesville, Georgetown, Granger, Hillsboro, Killeen, Kyle, Lexington, Lockhart, Luling, Marlin, Moody, New Braunfels, San Antonio, San Marcos, Seguin, Taylor, Temple, Thorndale, and Waco. In repositories that hold newspapers, special editions sometimes are filed apart from the regular editions and bound together by the name of the town or city.

ASSETS

An example of a special edition is the *New Braunfels Zeitung* (Figure 2-65), also published in German as the *Neu-Braunfeler Zeitung*, a special testimony to the strength and cohesiveness of the German community in Comal County well into the twentieth century. The special edition was published in multiple volumes that celebrated the history of Comal County and New Braunfels and surrounding communities; German immigration; local businesses and industries, including agriculture, education, and other topics of interest to local readers in the form of well-illustrated articles of varying lengths. While much of the edition offered information that is well-known to scholars, some articles included less-familiar stories, some of which do not appear in secondary sources about the county. One entitled "Rebuilding After the War Between the States," chronicled the generally disorganized character of agriculture in the county as plantations broke up, nascent industries declined, and farmers turned to cattle raising and freight hauling.

Others, relieved of competition with slave-raised cotton, continued to raise the crop on small farms where they also experimented with new undertakings such as beekeeping and the importation of new plants on a trial basis.

Newspapers, whether special editions or the regularly published daily or weekly, provide useful articles to the researcher of agricultural history in the forms of articles about agricultural activities in the community and county, descriptions of associated industries, obituaries of individuals involved in agricultural activities, and illustrations of landmarks associated with agricultural industries. If a long enough run of a newspaper exists, it may chronicle changes in attitude towards agriculture and its importance in the community.



Figure 2-65. The 100th edition of the New Braunfels newspaper that was published in 1952 is a typical example of a special edition Texas newspaper. Numerous articles celebrated the history of Comal County and a number of towns and identified important historical trends and residents. Dolph Briscoe Center for American History, The University of Texas at Austin.

LIMITATIONS

Because newspapers are published locally, they may tend both to booster local activities and to present a relatively narrow perspective when describing those activities. For this reason, statements in articles that compare agricultural production, agricultural “firsts,” or the importance of specific agriculturalists always should be substantiated by other sources. Locating specific topics and individuals tends to be difficult unless the newspaper has been digitized and is searchable through such aids as The Portal to Texas History or newspaperarchive.com.

APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS

Daily or weekly editions of local newspapers generally are not useful for the research that supports reconnaissance-level surveys, unless they are published in relatively remote areas that lack other sources of historical information, such as county histories. Special editions may be helpful in supplementing information available in the county histories typically used prior to reconnaissance-level surveys.

APPLICABILITY TO INTENSIVE-LEVEL SURVEYS

Daily, weekly, and special editions are useful in research that is associated with intensive surveys when the researcher is seeking specific information about an industry, farm, ranch, or individual associated with agriculture. Obituaries found in local newspapers often help to assess the local and even state significance of specific individuals, while special editions that highlight a particular farm or ranch may provide information not found in other sources.

ARCHIVAL COLLECTIONS: PERIODICALS

Dolph Briscoe Center for American History at The University of Texas at Austin, Cushing Memorial Library at Texas A&M University

DESCRIPTION

Numerous periodicals describe and discuss topics of general and specific interest to farmers, stock farmers, ranchers, and those involved in supporting industries (*Figure 2-66*). In Texas, such publications began as early as the mid-nineteenth century, and they became prolific in number beginning in the last quarter of the nineteenth century. While there are fewer in the early twenty-first century, many of the surviving periodicals associated with agriculture have long runs of publication that focus on specific agricultural activities.

One of the most useful periodicals, because it focused on the raising of a wide range of agricultural products and was published for 80 years, is *Texas Farm and Ranch*, also known as *Farm and Ranch* (*Figure 2-67*). The publication began in Austin in 1883 and then moved to Dallas with final publication in 1963. In some repositories, the publication is available in both microfilm and original formats. *Texas Farm and Ranch* was heavily illustrated and included articles of general and special interest to farmers, stockmen, and ranchers. Each issue included letters from agriculturalists from all parts of Texas.

A range of topics discussed and illustrated in one issue (January 20, 1894) included farm machinery, characteristic fences (*Figure 2-68*), a report from the Texas Live Stock Association, and a discussion of tobacco in Texas.

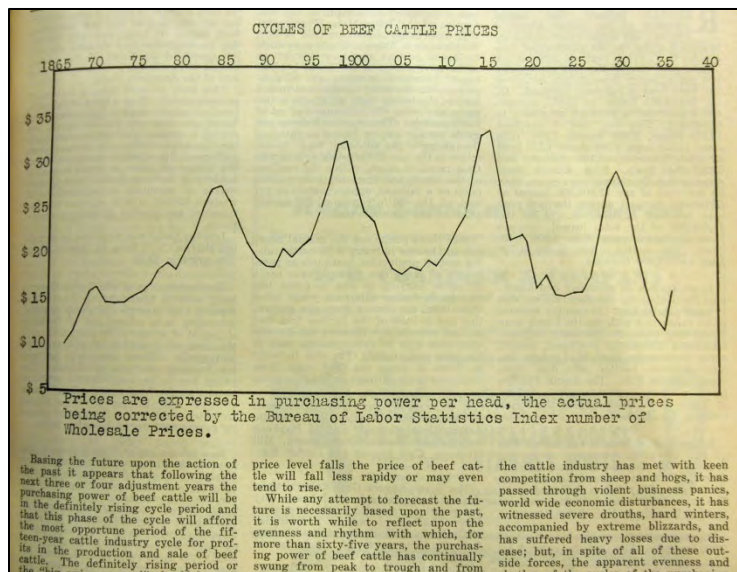


Figure 2-66. The Cattleman, a monthly periodical, published articles about topics of interest to agriculturists that are helpful in developing historic contexts. G.P. Walker, Jr., "Cattle Industry Cycles," The Cattleman, Volume XXIII, no. 4 (September 1936):34-35.

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Figure 2-67. *Texas Farm and Ranch*, published for 80 years, included numerous articles about practical aspects of all types of agricultural endeavors, discussions of federal and state laws and policies that impacted agriculture, and many other topics.



Figure 2-68. An article in *Texas Farm and Ranch* was well illustrated with examples of fencing materials and forms. *Texas Farm and Ranch*, Volume XIII, no. 4 (January 27, 1894).

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► ASSETS

Periodicals, particularly those that are focused on agriculture generally or on aspects of agriculture such as livestock, dairying, or crop production, include articles about topics of general and specific interest to agriculturalists. They also may publish discussions about pertinent state and federal legislation, obituaries of notable individuals, and articles about new developments in areas related to agriculture.

► LIMITATIONS

Unless the periodical has been digitized or included in indexes such as the General Reference Index at the Dolph Briscoe Center for American History, information in them often is difficult to access. Use of obituaries, for example, may depend on the researcher's knowledge of an individual's date of death.

► APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS

For the most part, agriculture-related periodicals have not been digitized and most lack indices. For that reason, periodicals are limited in their use for reconnaissance-level surveys because information about specific topics and geographical areas may be difficult to access.

► APPLICABILITY TO INTENSIVE-LEVEL SURVEYS

Periodicals may be useful to intensive-level surveys because they tend to include articles that are targeted on topics that are pertinent to particular property types, agricultural activities, laws, and market trends. In the form of obituaries, they may include biographical information that places the deceased in a broader context than that provided in the standard newspaper obituary.

ARCHIVAL COLLECTIONS: GOVERNMENT PROGRAMS

Texas Agricultural Extension Service, Texas Department of Agriculture Family Land Heritage Program; NRHP, RTHL, SAL designations; COG and county historical commission surveys; THC architectural surveys

Cushing Memorial Library at Texas A&M University, Texas Department of Agriculture, Texas Historical Commission

DESCRIPTION

Archival collections associated with federal-, state-, or county-level government programs often include primary source information that never appears in secondary sources (books, bulletins, articles). They consist of field-level data in a variety of formats that are associated with specific properties and agricultural activities. For example, the relatively brief entries that appear in the Texas Department of Agriculture annual listing of new Family Land Heritage Program properties summarize original materials supplied by applicants that may include documents not available in official repositories (*Figure 2-69*). The monthly reports of the county agents include county- and sometimes property-level agricultural data that do not appear to be available in any other source. The survey, report, and nomination files of the Texas Historical Commission include photographs of agricultural properties that may date as early as the 1970s (*Figures 2-70, 2-71, and 2-72*); associated reports occasionally include assessments of both individual properties and landscapes.



Figure 2-69. The file submitted by owners of the K.W. Ranch Ltd. seeking designation as a Family Land Heritage property includes copies of photographs that depict historic landscapes and buildings.

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NRS4-20776

COUNTY	QUAD	BLOCK	COG	RUR	4-G
CITY	LOT				R-52

NAME: VALTIN FUHRMANN HOMESTEAD COUNTY: COMAL
ADDRESS: HWY 311, 6 MI. W. of 281 (SPRUE BARN) CITY: RURAL
ARCHITECT/BUILDER: PERIOD: LSS
STYLE: PIONEER GERMAN DATE: C. 1850
OWNER: HERMAN HITZFELDER THEME: AAPG
SIGNIFICANCE: COMPLEX OF BLDGS., 1 STORY FRAME w/ WINDOWS, W/ PORCH (VICTORIAN COTTAGE). LONG BARN COMPOSED OF LOG CABIN, FACHWERK CONST. BLACKSMITH SHOP, ORIGINAL TOOLS, ARTIFACTS & FORGE. STONE BARN & PENS. EXCELLENT VARIETY W/IN COMPOUND.
DESIGNATION: NR NHL THL HABS HAER OTHER:
ORIGINAL USE: HOMESTEAD
PRESENT USE: RESIDENCE
PHYSICAL CONDITION: GOOD
altered/unaltered:
CONSTRUCTION: LIMESTONE, LOG, FACHWERK, & FRAME
roof material: CORRUGATED TIN
RELATIONSHIP TO SURROUNDINGS:
BIBLIOGRAPHIC DATA:
INFORMANT:
RECORDED BY: SK/ MY PHOTOGRAPHIC DATA:
DATE: 12-1-76 SEE INFO/CORRESPONDENCE FILES:

Figure 2-70. Survey files at the Texas Historical Commission include data cards such as this one that recorded the appearance of buildings at the Valtin Fuhrmann property in Comal County.

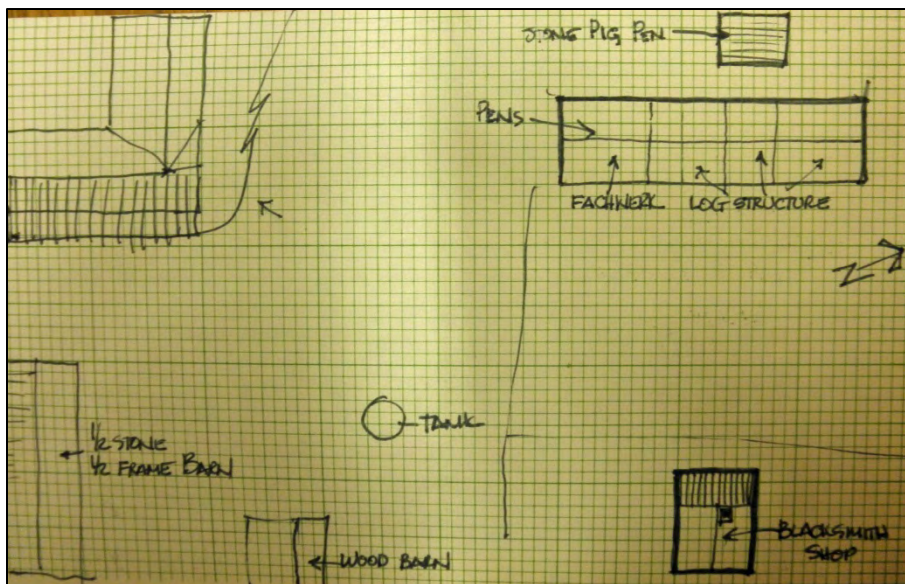


Figure 2-71. The back of the data card depicting the Valtin Fuhrmann property shows the layout of the buildings located in the vicinity of the Fuhrmann house.

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Figure 2-72. A photograph that is part of the survey file depicts agricultural buildings at the Fuhrmann property. Such photographs, made almost 37 years ago, are helpful because they record the appearance of Comal County's rural landscape prior to much of the intense redevelopment that has occurred in the early twenty-first century.

ASSETS

Such collections may be a treasure trove of primary source materials in the forms of notes, daily reports, genealogical information, historic photographs, maps, and other records. Such records often are of great use to historians interested in agricultural processes, buildings, structures, and landscapes. The photography and assessments may be done by historians, architectural historians, and architects who meet the qualifications of the Secretary of the Interior, making them records of particular value. Finally, many of the photographs associated with records at the THC (see *Figures 2-70, 2-71, and 2-72*) were taken prior to construction of a number of transportation and suburban and rural development projects. As a result, they may provide a record that can be used to gage rates of change in landscapes.

LIMITATIONS

Archival collections associated with government programs are limited by the scope of the programs: agricultural properties whose owners have not participated in the programs will not be represented in the universe of agricultural properties in general, and so the historian's perception of the impacts of the programs or the importance of any given participant may be skewed and inaccurate.

APPLICABILITY TO RECONNAISSANCE-LEVEL SURVEYS

Records such as NRHP, RTHL, and SAL nominations as well as THC, COG, and locally sponsored architectural surveys should be reviewed prior to beginning any reconnaissance-level survey. They alert researchers to previous inventorying work and to properties that have been designated historic or of value to local communities, and they may provide imagery that can be used for comparative

purposes. Both reports and archival records may alert researchers to planned activities in the twentieth century that had significant impacts on agricultural landscapes. They also may assist in identifying property types.

► **APPLICABILITY TO INTENSIVE-LEVEL SURVEYS**

Where property-specific information based on legal abstracts or in associated secondary literature is available, archival collections resulting from government programs can be very useful. They often provide datable descriptions and images of buildings, structures, and landscapes associated with specific agricultural enterprises. Those may aid researchers in efforts to identify property types and to assess integrity and significance.

CHAPTER 3: ONLINE SOURCES, DESCRIPTIONS, AND USES

The following chapter identifies online sources useful for researchers interested in agricultural history, technology, architecture, and related subjects. The online sources are intended to aid researcher's efforts to understand agricultural resources and sites. The material available online includes a broad array of primary and secondary information, including historic photographs, newspapers, technical bulletins, government reports and statistics and agricultural journals. The guide below describes key features and analyzes the usefulness of each website.

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Portal to Texas History

<http://texashistory.unt.edu/>



Figure 2-73. Screen capture from The Portal to Texas History.

Organized by the University of North Texas, *The Portal to Texas History* is an important online collection of digitized resources relating to Texas history (Figure 2-73). Collected from numerous state archives, libraries, museums and historical societies, the website includes historic photographs, newspapers, journals, books, maps, and correspondence. The “keyword search” function enables researchers to quickly locate pertinent full-text, primary source records. The website is particularly useful for researchers interested in locating Texas historical information on a local, county or statewide level.

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University of Texas at San Antonio (UTSA) Digital Collections

<http://digital.utsa.edu/cdm/>

UTSA The University of Texas at San Antonio
DIGITAL COLLECTIONS

Home | Search | Help

The UTSA Libraries are proud to preserve the legacies of San Antonio and South Texas through our growing collection of rare books, personal papers, photographs, and other one-of-a-kind primary resources.

Several collections have been digitized and can be searched, viewed and downloaded from this site. The digitization process is ongoing, and new collections are added as they become available.

Included in these collections are materials from the **Institute of Texan Cultures**, UTSA's cultural heritage museum noted for its rich photography archive, as well as the university's own archives.

Visit the **UTSA Libraries' Special Collections website** to learn more and to search the catalog for information on those collections not yet digitized.

HemisFair '68

Serie Project

San Antonio Light Photo Collection

Zintgraff Photo Collection

UTSA History/Publications

Center for Archeological Research

Browse the Collections >>

Arcenio A. Garola Papers	Jose Angel Gutierrez Papers
Center for Archaeological Research	Oral History Collection
General Collection-Institute of Texan Cultures	Rare Books Collection
General Collection-UTSA Libraries	San Antonio and Casino Club Records
Hattie Elam Briscoe Papers	San Antonio Light Collection
Helen Cloud Austin Papers	Serie Project, Inc. Print Collection
HemisFair '68	Sons of the Republic of Texas, Kathryn Stoner O'Connor Mexican Manuscripts
Howell Collection	UTSA History
ITC Contemporary Indians of Texas Documentary Series	UTSA Paisano Student Newspaper
John Peace Collection	UTSA Publications
	Zintgraff Collection

Browse by Date >>

1800-1850	1961-1970
1851-1900	1971-1980
1901-1925	1981-1990
1926-1950	1991-2000
1951-1980	2001-Present

UTSA LIBRARIES

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Figure 2-74. Screen capture from the UTSA Digital Collections.

Organized by the University of Texas at San Antonio, the UTSA Digital Collections website includes a rich array of primary resources covering San Antonio history, architecture and rural history in South Texas (Figure 2-74). The collection includes historic photographs from the Institute of Texan Cultures, manuscript collections, archeological reports from the Center for Archaeological Research and oral history collections. All of the collections are available for browsing, with some including searchable and

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downloadable documents. The website is primarily useful for researchers interested in South and Central Texas history.

Images of a Rural Past (Texas A&M University, Cushing Library)

<http://www.flickr.com/photos/cushinglibrary/collections/72157617092580769/>

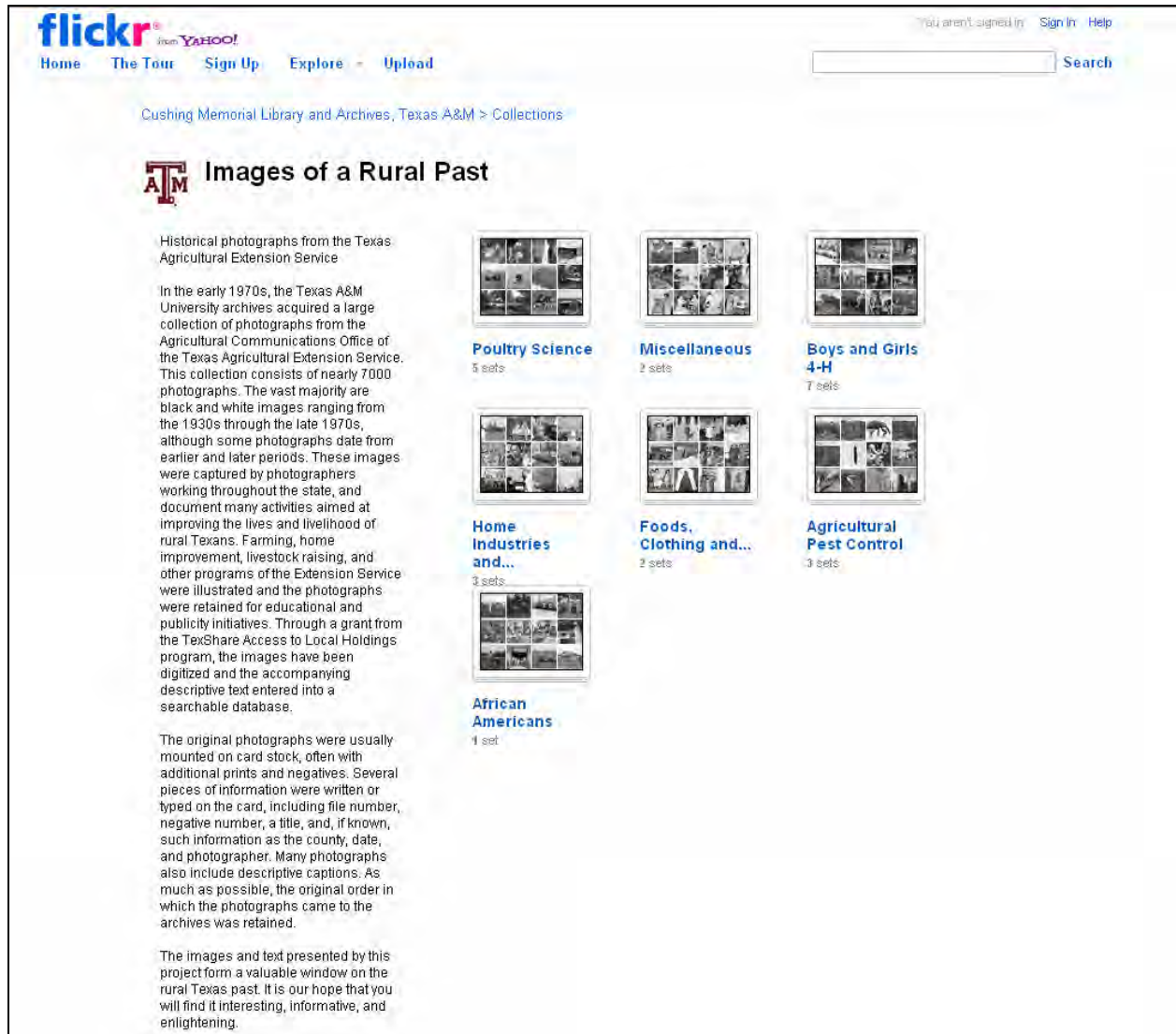


Figure 2-75. Screen capture of Images of a Rural Past photographic collection organized by Texas A&M University.

Organized by Texas A&M University, the *Images of a Rural Past* photographic collection consists of nearly 7,000 photographs from the Texas Agricultural Extension Service, dating from the 1930s through the late 1970s (Figure 2-75). Taken throughout Texas, the images primarily capture the lives of rural Texans and address farming, home improvement, livestock raising and other programs of the Extension Service. The images are particularly useful documents and include the role of African-Americans in Texas agriculture, animal science, home industries and agricultural planning. The collection can aid researchers

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interested in seeing visual representations of typical farm sites, agricultural practices and architecture from the 1930s to the 1970s.

Growing a Nation, The Story of American Agriculture (U.S. Department of Agriculture)

<http://www.agclassroom.org/gan/timeline/index.htm>

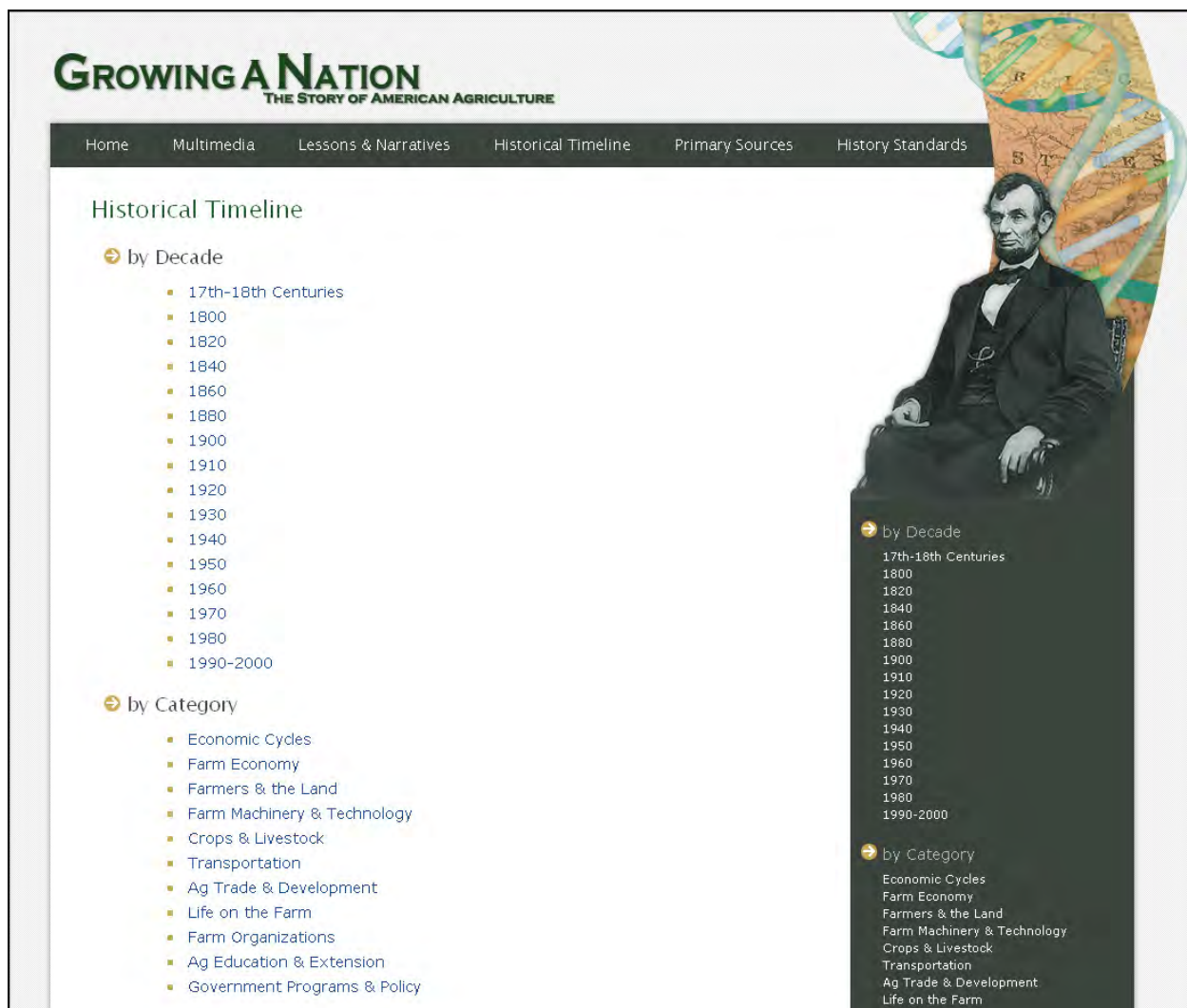


Figure 2-76. Screen capture of Growing a Nation, The Story of American Agriculture developed by the United States Department of Agriculture.

Developed by the United States Department of Agriculture, *Growing a Nation, The Story of American Agriculture* provides historical background information concerning the evolution of agriculture in the United States (Figure 2-76). The organization of the website is simple and very user-friendly. Information can be accessed by decade (1600s to current) or by category, including farm economy, crops and livestock, transportation, etc. The website is particularly useful for researchers interested in understanding key national economic, political and social trends affecting the evolution of agriculture in

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the United States. For example, by identifying 1930s era federal laws regulating dairy practices, a researcher might better understand the national context driving statewide agricultural trends.

The Core Historical Literature of Agriculture (Cornell University)

<http://chla.mannlib.cornell.edu/c/chla/browse/1940.html>

The CORE HISTORICAL LITERATURE Of AGRICULTURE
Albert R. Mann Library, Cornell University

Browse CHLA [Also try Simple Search](#)

This is a complete bibliography of books and journals in Core Historical Literature of Agriculture, organized by both author and title or by publication year:

[A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [F](#) | [G](#) | [H](#) | [I](#) | [J](#) | [K](#) | [L](#) | [M](#) | [N](#) | [O](#) | [P](#) | [Q](#) | [R](#) | [S](#) | [T](#) | [U](#) | [V](#) | [W](#) | [X](#) | [Y](#) | [Z](#) | [Non-alphabetic](#)

[1620-1639](#) | [1640-1659](#) | [1720-1739](#) | [1800-1819](#) | [1820-1839](#) | [1840-1859](#) | [1860-1879](#) | [1880-1899](#) | [1900-1919](#) | [1920-1939](#) | [1940-1959](#) | [1960-1979](#) | [1980-1999](#)

[Journal Title List](#)

1920

- [Agricultural meteorology: the effect of weather on crops](#) **Smith, John Warren**. New York : Macmillan, 1920.
- [Agricultural prices](#) **Wallace, Henry A.** Des Moines, Iowa : Wallace Publishing Company, [c1920]
- [American rural highways](#) **Agg, T. R.** New York : McGraw-Hill Book Company, Inc., 1920.
- [Annals of the Entomological Society of America](#) **Entomological Society of America**. Lanham, Md. : Entomological Society of America, (1908 - 1950)
- [A biographical catalog of the portrait gallery of the Saddle and Sirloin Club](#) **Wentworth, Edward N; Saddle and Sirloin Club**. Chicago, Ill. : Union Stock Yards, 1920.
- [Bulletin](#) . Madison, Wis. : American Association for Agricultural Legislation (1918 - 1920)
- [Bulletin Cornell University. Agricultural Experiment Station](#). Ithaca, N.Y. : Cornell University Agricultural Experiment Station, New York State College of Agriculture. (1888 - 1970)
- [Bulletin New York State Agricultural Experiment Station](#). Geneva, N.Y. : New York State Agricultural Experiment Station, (1885 - 1970)
- [The butter industry: prepared for the use of creameries, dairy students and pure food departments](#) **Hunziker, Otto Frederick**. La Grange, Ill. : Otto F. Hunziker, 1920.
- [The carbohydrates and alcohol](#) **Rideal, Samuel**. London : Baillière, Tindall and Cox, 1920.
- [Cornell extension bulletin](#) **Cornell University. Cooperative Extension; New York State College of Agriculture; New York State College of Human Ecology; New York State College of Home Economics**. Ithaca, N.Y. : New York State College of Agriculture, (1916 - 1981)
- [Cornell reading course for the farm](#) **New York State College of Agriculture**. Ithaca, N.Y. : New York State College of Agriculture (1911 - 1923)

Figure 2-77. Screen capture of The Core Historical Literature of Agriculture, assembled and managed by Cornell University.

Assembled and managed by Cornell University, the *Core Historical Literature of Agriculture* website is a broad collection of documentary resources relating to United States agricultural history from 1620 to the modern day (Figure 2-77). The website includes full access to published and unpublished records such as newspapers, almanacs, memoirs, county extension service publications, local, regional and national agricultural journals, and farm records. Overall, the website is an excellent source for identifying historical trends on a national scale. As the website is searchable by keyword, researchers can identify specific concepts, track how farming has evolved over a set period, or understand key economic factors during the Great Depression. The website includes a wealth of information including

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agricultural science, architecture, experimentation and social and economic history. While specific information relating to Texas agricultural history is covered, the website's strength is the national scope of the documentary resources.

USDA Census of Agriculture, Historical Census Publications

http://www.agcensus.usda.gov/Publications/Historical_Publications/index.php

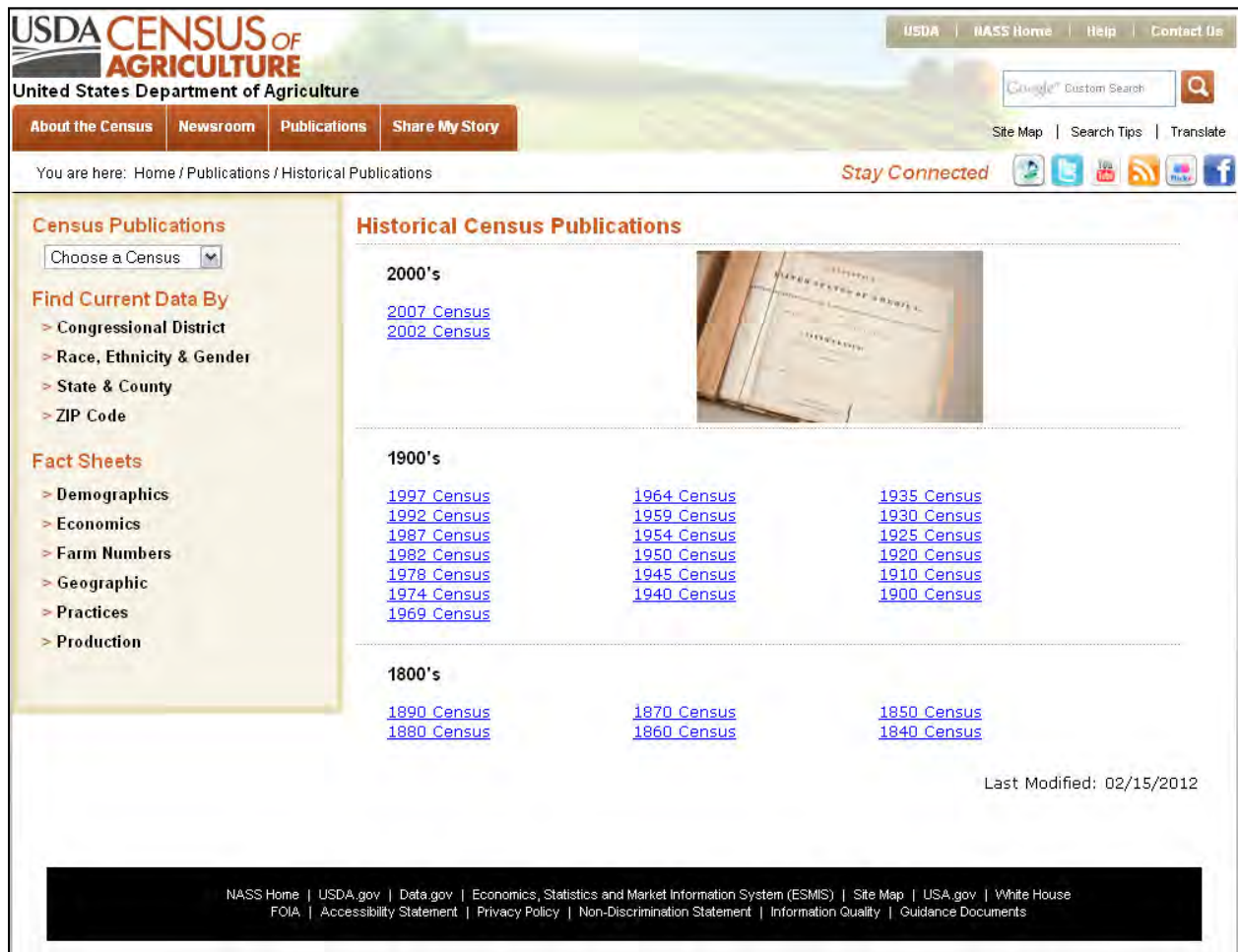


Figure 2-78. Screen capture of the USDA Census of Agriculture, Historical Census Publications website.

Developed by the United States Department of Agriculture, the Census of Agriculture website includes historic agricultural censuses from 1840 to 2007 (Figure 2-78). The statistics included in the censuses include a variety of information, including farm type, farm acreage, farm value, crop type, and reports by individual states. The censuses provide detailed information at the national, state and county level. For researchers, the information can be very useful, such as in understanding the agricultural character of a particular county at any point during its development. The censuses can also provide detail about the significance of certain Texas crops as compared to the rest of the country.

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University of Virginia Library, Historical Census Browser

<http://mapserver.lib.virginia.edu/index.html>

UNIVERSITY of VIRGINIA LIBRARY

Historical Census Browser

What can you do on this site?

- Examine state and county topics for individual census years.
 - examine multiple topics within a census year
 - produce tables of data by state or county
 - sort data by selected categories
 - create ratios between any two data categories

Choose a census year to begin examining data:

1790	1800	1810	1820	1830	1840	1850	1860	1870
1880	1890	1900	1910	1920	1930	1940	1950	1960


- Examine state and county topics over time.
 - examine a topic across multiple census years
 - produce tables of data by state or county

Choose a category to begin examining data:

General Population	Ethnicity/Race/Place of Birth
Education & Literacy	Agriculture
Economy/Manufacturing/Employment	Slave Population

- Generate maps of selected data

Click on "Map It!" at the top of data columns to view the data in the form of an interactive map.



What you cannot do on this site:

- Find Information about individuals
- Find information for areas below the county level (e.g. cities, census tracts)

About the Historical Census Browser

The data and terminology presented in the Historical Census Browser are drawn directly from historical volumes of the U.S. Census of Population and Housing.

To Cite This Collection (APA Style)

(2004). Historical Census Browser. Retrieved [Date you accessed source], from the University of Virginia, Geospatial and Statistical Data Center; <http://mapserver.lib.virginia.edu/collections/>

Figure 2-79. Screen capture of the Historical Census Browser, developed by the University of Virginia.

Developed by the University of Virginia, the Historical Census Browser is a powerful tool combining targeted topics with historical census information (Figure 2-79). By entering topics such as farm size or crop type at a county or state level, the browser allows users to compare census data across multiple decades. Displayed graphically as a map and a table, the information allows users to analyze complex data in a simple, user-friendly format. In addition to agricultural data, the browser can incorporate population data, race, education, and economic activity.

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Library of Congress, Farm Security Administration photographs

<http://memory.loc.gov/ammem/fsahtml/>



Figure 2-80. Screen capture of the Library of Congress' American Memory website.

The Library of Congress' *American Memory* website includes photographs from the Great Depression. The photographs, commissioned by the Farm Security Administration, depict a wide range of subjects, including the increasing role of farm mechanization and tenant farming (Figure 2-80). The collection can aid researchers interested in visual representations of typical 1930s farm sites, agricultural practices and architecture. Users can navigate the photographic collection by keyword, subject or geographic location. Thus, researchers interested in viewing images from a specific county in Texas can simply limit the search along those lines.

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Experiment Station Records, 1889-1941 (University of North Texas Libraries)

<http://digital.library.unt.edu/explore/collections/USESRD/browse/>

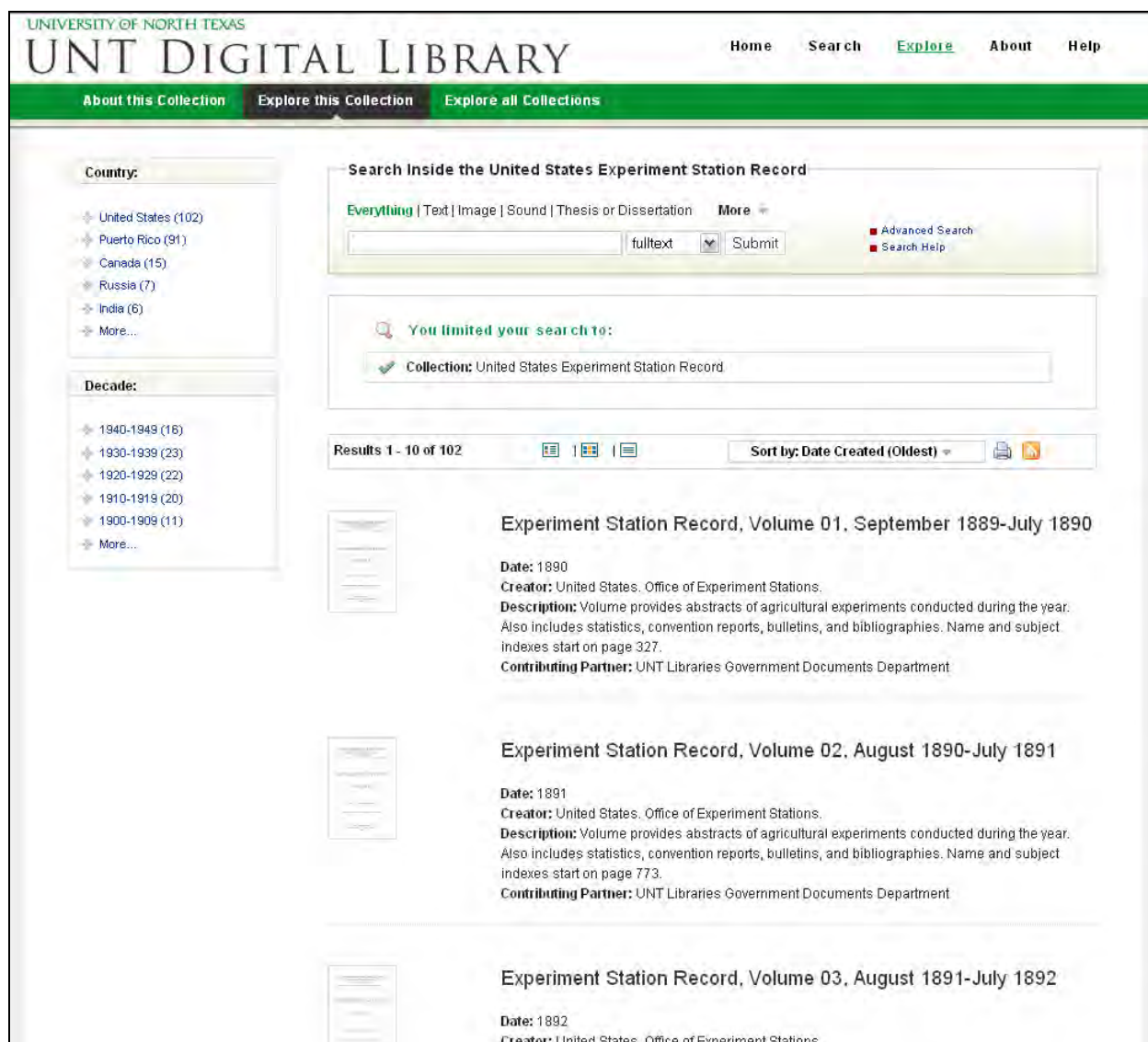


Figure 2-81. Screen capture of the UNT Digital Library.

Organized by the University of North Texas, the website includes a digitized collection of United States Experiment Station Records. Produced from 1889 to 1946 by the Office of Experiment Stations, these records include statistics, convention reports and bulletins relating to the work of experiment stations across the country (Figure 2-81). Created to coordinate state and local agricultural research efforts with the Department of Agriculture, experiment stations were an important factor in spreading new research to farmers across the country. Using a keyword search, researchers can use the collection to better understand important historic scientific and research efforts that have shaped the development of agriculture.

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Farm, Field and Fireside, Agricultural Newspaper Collection, 1841-1927 (University of Illinois)

<http://www.library.illinois.edu/dnc/Default/Skins/FFF/Client.asp?Skin=FFF&AW=1330711677956&AppName=2>

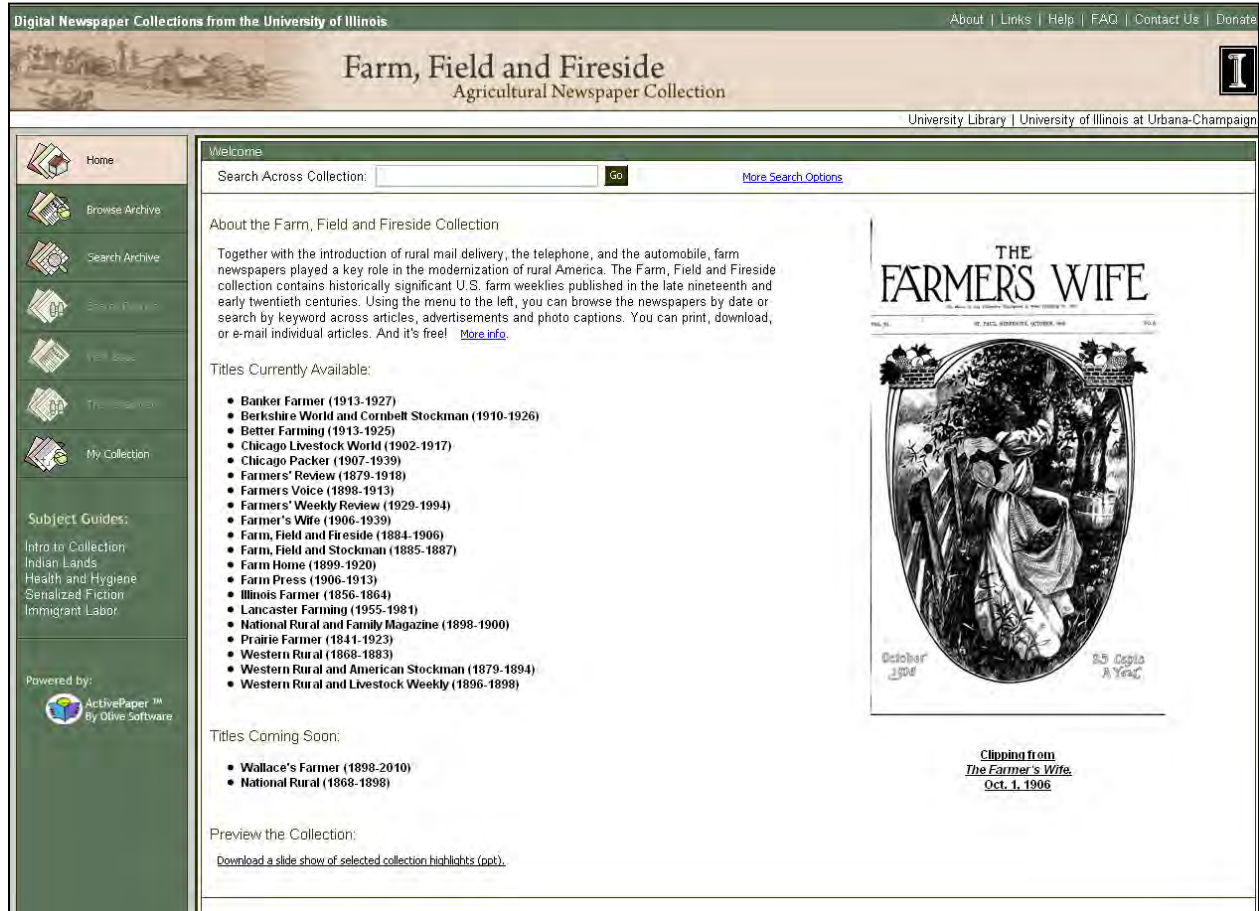


Figure 2-82. Screen capture of the Farm, Field, and Fireside Agricultural Newspaper Collection organized and managed by the University of Illinois.

Organized and managed by the University of Illinois, the *Farm, Field and Fireside Agricultural Newspaper Collection* is a collection of late nineteenth and early twentieth century farm weeklies across the United States (Figure 2-82). The collection includes a large number of newspapers including *Farm Home*, *Better Farming* and *Farmers' Review*. Fully searchable by keyword, the newspaper collection provides an invaluable view of farm life and practices during this period. The information provided in the newspaper collection provides researchers with contextual information about how farming practices have evolved.

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Organic Roots Collection – agricultural bulletins, journals, and publications prior to 1942 (U.S. Department of Agriculture)

<http://organicroots.nal.usda.gov/>



Figure 2-83. Screen capture of the Organic Roots Collection organized by the United States Department of Agriculture.

Organized by the United States Department of Agriculture, the *Organic Roots Collection* is comprised of pre-1942 agricultural literature, such as *Farmers' Bulletin* (Figure 2-83). Created to highlight the practice of sustainable agriculture prior to the introduction of pesticides and synthetic chemicals in the 1940s, the site is an excellent resource for researchers interested in agricultural practices in the nineteenth and early twentieth centuries. Through bulletins and other technical reports, the website allows researchers to better understand how farmers managed specific types of farms including poultry, cattle, and crop farming. In understanding such small-scale farming practices, researchers can gain important contextual information and details that can aid identification of agricultural properties and sites. In addition, the searchable keyword function allows researchers to better identify the historical meaning of difficult technical, scientific or agricultural concepts and terminology.

CHAPTER 4: OTHER STATES' HISTORIC CONTEXTS

INTRODUCTION

In compiling this *Research Guide and Methodology*, the project team reviewed statewide historic contexts, a research design, evaluation methodologies, and a multiple property document about agricultural properties that have been prepared for other states. These studies provide insight to how other states assess their agricultural properties. They also provide researchers with an understanding of how national trends in economics and politics, as well as innovations, affect agricultural properties. Such publications often provide examples of typology analyses for property types that are found in Texas, as well as numerous bibliographic sources that are not state-specific.

The publications reviewed as part of this study were from California, Georgia, Minnesota (two studies), Pennsylvania, and South Dakota. *Table 2-2* identifies the state, provides a brief bibliographic reference, and summarizes the applicability of each work to studies of Texas agricultural resources. The text following *Table 2-2* provides a summary of each publication and identifies sections that are applicable to Texas agricultural studies.

Table 2-2. Publications and applicability.

State	Author(s) and Year Completed	Applicability to Texas
California	California Department of Transportation 2007	<ul style="list-style-type: none">• Information about national trends and economic influences• Research questions included in the Archeological Research Design section of the document.
Georgia	Messick, Joseph and Adams 2001	<ul style="list-style-type: none">• Information on national trends regarding cotton farming and raising of livestock.• Typology analysis of outbuildings.• Evaluation methodology, including significance discussions and integrity considerations that are applicable to individual agricultural resources and rural historic districts in Texas.
Minnesota	Mead & Hunt 1998	<ul style="list-style-type: none">• Insight about assessing rural historic districts, including integrity and boundary assessments.• Examples of how to identify rural historic districts using the 11 landscape characteristics per National Park Service (NPS) guidance.
	Granger and Kelly 2005	<ul style="list-style-type: none">• Information about national developments in agricultural practices, innovations, government programs, and economic influences.• Descriptions and information about development of several resource types.• Extensive bibliography per chapter.
Pennsylvania	McMurry, Sally 2012	<ul style="list-style-type: none">• Evaluation methodology for individual agricultural resources and rural historic districts.

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Table 2-2. Publications and applicability.

State	Author(s) and Year Completed	Applicability to Texas
South Dakota	Brooks and Jacon 1994	<ul style="list-style-type: none">• Information on ranching at the national scale.• Information regarding farming, such as national trends, laws, economics, and equipment innovations at the national level.

California

California Department of Transportation. *A Historical Context and Archaeological Research Design for Agricultural Properties in California*. Sacramento, CA: California Department of Transportation, 2007. Available at <http://www.dot.ca.gov/ser/guidance.htm#agstudy>.

The California Department of Transportation publication about agricultural properties is divided into two main sections: 1) a historic context, and 2) an archeological research design. The first section of the document (context) includes an overview of agricultural development in the state. Much of this section is a nationally based historic context that is focused on agricultural trends and developments with an overview of agricultural development in the state and pertinent information about California history. This section also outlines California's geographic regions, California laws regarding land acquisition, and California-specific agricultural production (e.g., citrus farming, wine industry, and dairy farming). It provides a brief history of the development of irrigation systems in California's Central Valley and San Joaquin Valley. Although information regarding irrigation in California may provide comparative information, TxDOT's study of irrigation resources produced by Lila Knight in 2009 (*A Field Guide to Irrigation in the Lower Rio Grande Valley* available at http://www.txdot.gov/txdot_library/consultants_contractors/publications/environmental_resources.htm#studies) provides the most comprehensive information regarding the irrigation history of the Lower Rio Grande area in Texas and an irrigation resource typology that can be used for irrigation resources throughout Texas. While it is possible to use the information regarding California-specific agricultural production for comparative purposes with Texas crops (e.g., citrus farming, beef cattle, and irrigated vegetable farming), it is not likely that such information would be helpful to reconnaissance-level surveys.

The California historic context also outlines transportation, mechanization, and supporting infrastructure in the agricultural development of the state. While much of this information is California-specific, particularly in reference to railroad lines and connectivity of facilities, some of the history (particularly in reference to mechanization and infrastructure facilities) is applicable to Texas and other states. In addition, the context identifies topics that should be addressed in any state-level context development, regardless of location.

Like most other states' historic contexts, the California context has a typology analysis of resources commonly found associated with agricultural properties. Beyond the domicile, the "agricultural features

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systems” is identified as the remainder of an agricultural property. This concept of an agricultural system reinforces the idea that an agricultural property encompasses many building types, including barns, ancillary structures, and yards. While this is an interesting concept, much of the information included in the report regarding agricultural property types in California is very general, with only two pages of text dedicated to discussing agricultural feature systems.

The second section of the report is an archeological research design for researching agricultural properties. While this section’s focus is on archeological resources, many of the same research questions and relevant data needs are applicable to researching the built environment. The research design outlines the types of questions, the archival sources to utilize, and challenges in researching specific elements of agricultural properties, such as land use patterns, concentrations of ethnicity and cultural groups, and the history of labor and migrant workers.

While there are some similarities between Texas’s and California’s agricultural histories, such as the establishment of large-scale irrigation systems around the turn of the twentieth century and the widespread use of migrant workers, there are vast differences between the states’ agricultural histories and development. The parts of the California publication that would be most beneficial when identifying, evaluating, and researching Texas agricultural resources are the first section of the historic context, which includes information about national agricultural trends (for reconnaissance-level surveys), and the archeological research design’s research questions (for reconnaissance- and intensive-level surveys).

Georgia

Messick, Denise P., J. W. Joseph, Ph.D., and Natalie P. Adams. *Tilling the Earth: Georgia’s Historic Agricultural Heritage – A Context*. Prepared for the Georgia Department of Natural Resources and the Georgia Department of Transportation, 2001. Available at <http://www.dot.state.ga.us/doingbusiness/research/Documents/reports/9803.pdf>.

The historic context prepared for the Georgia Department of Natural Resources and the Department of Transportation by Denise Messick, J. W. Joseph, and Natalie P. Adams is divided into three main sections: 1) chronological history of the development of agriculture in Georgia, 2) typology of agricultural properties, landscapes, buildings, and structures, and 3) NRHP eligibility criteria and integrity considerations. The history of Georgia agriculture in this study is heavily focused on the pre-1900 development of farms in the state. It is broadly applicable to Texas because of its focus on crops widely grown there (e.g., peanuts and fruit). In addition, the discussions regarding cotton cultivation and raising of livestock may provide useful in understanding national fluctuations in markets. It should be noted that the discussions regarding rice farming do not appear to be applicable since Georgia rice farming occurred in the antebellum years and utilized natural flooding methods and slave labor.

The next section of the document focuses on typologies based on four basic farm types in Georgia: farms that separate labor and management, farming with non-familial labor, cash crop farming, and

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large landholding farming. The authors' analysis further subdivides Georgia farms by their temporal, physical, geographical, and cultural attributes. While this is an interesting approach, it is specific to Georgia and, if applied in Texas, would require a statewide analysis of several Texas-specific elements, such as geography, topography, soils, and ethnicity. A feature of the Georgia study that would be applicable to the identification and evaluation of Texas agricultural resources is the discussion about building types, which includes outbuilding types that are similar to those found in Texas, such as transverse crib barns, side drive crib barns, and pump houses.

Evaluation methodology and recommendations make up the final section of the Georgia report. The significance criteria and integrity considerations outlined in the report are specific to agricultural properties and, of the state historic contexts and other publications reviewed, provide some of the best guidance for evaluating historic agricultural properties. In particular, the integrity discussions include examples specific to agricultural properties, and they cross-reference the 11 landscape characteristics outlined in the National Park Service (NPS) Bulletin *Guidelines for Evaluating and Documenting Rural Historic Landscapes*. Additionally, the Georgia report provides a list of questions to help identify what types of agricultural properties are in a particular survey area and how NRHP boundaries can be drawn if a property is determined NRHP eligible. This guidance in the Georgia context is applicable to identifying and assessing agricultural resources in any state.

It is recommended that the Georgia report could be utilized for reconnaissance- and intensive-level surveys. Some of the information included in the typology analysis, the evaluation methodology, and boundary assessments guidance could be helpful for identifying and understanding a variety of agricultural resources, property types, and locations.

Minnesota

Two studies have been completed for the evaluation of agricultural properties in Minnesota. The first study was completed by the Wisconsin-based firm, Mead & Hunt, Inc. (Mead & Hunt) in 1998. The second study, completed in 2005, consists of three large volumes with Susan Granger and Scott Kelly as the primary authors. The following is an assessment of each of these statewide studies and their applicability to Texas agricultural resources.

Mead & Hunt, Inc. *Identifying Minnesota's Historic Agricultural Landscapes: Phase II Report*. Prepared for the Minnesota State Historic Preservation Office, 1998. Available at <http://www.mnhs.org/preserve/shpo/landscape/methods1.html>.

The Mead & Hunt report is different from most of the other publications described in Chapter 4 of the *Research Guide* because it appears to be part of a Section 106 project that focused on one particular area of Minnesota. Rather than including a historic context, the Mead & Hunt study's focus was to establish an evaluation methodology to identify and evaluate rural historic landscapes in Minnesota. The authors created an evaluation methodology based on the review of NRHP evaluations, surveys, and manuals produced by the NPS and the California Department of Transportation. The documents that

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were reviewed and evaluated provided Mead & Hunt information on how integrity and boundaries had been evaluated in other contexts, locations, and conditions. The remainder of Mead & Hunt's report discusses the identification of rural historic landscapes in Minnesota by outlining the 11 landscape characteristics defined in the NPS bulletin, *Guidelines for Evaluating and Documenting Rural Historic Landscapes*. For those Texas researchers not familiar with how to assess the 11 landscape characteristics, Mead & Hunt's report provides several examples (from other reports) of how to complete a rural historic landscape assessment.

While Mead & Hunt's online report provides valuable assessments of several evaluation methodologies, it does not include a discussion of Mead & Hunt's own evaluation methodology for assessing a select group of rural historic landscapes in Minnesota. Furthermore, there is no indication that the various evaluation methodologies reviewed were particularly innovative or creative. However, Mead & Hunt's report is recommended for Texas researchers who are completing a rural historic district evaluation and are seeking examples of how to review the 11 landscape characteristics.

Granger, Susan and Scott Kelly. *Historic Context Study of Minnesota Farms, 1820-1960 (Volumes I, II, and III)*. Prepared for the Minnesota Department of Transportation. 2005. Available at <http://www.dot.state.mn.us/culturalresources/studies/farmsteads.html>.

The second Minnesota publication reviewed, an historic context, was completed for the Minnesota Department of Transportation in 2005 by Granger and Kelly. Its three volumes include information about national trends in the history of agricultural practices, innovations, government programs, and economic influences. Additionally, the context includes descriptions of many types of farm- and ranch-related structures and information regarding the development of agricultural buildings and materials.

Volume I of the study is the historic context; it provides timelines and outlines information regarding specific types of farming and ranching that may prove useful to Texas researchers. For example, a section of the document outlines the basic practices of dairy farming. While much of the information is specific to Minnesota, information regarding innovations and government programs would be useful in developing and understanding the contextual development of dairy farms in Texas. Also helpful in this volume is the following information:

- Timeline of technological advances, government programs, and economic milestones for each period in the history of Minnesota agricultural development.
- General information regarding the development of farm buildings; for example, a discussion regarding the development of Quonset huts is included as well as illustrations of these buildings from a 1957 edition of *Agricultural Engineering*.
- Development of building materials utilized for farm buildings.
- Glossary of terms for components of outbuildings.
- Cross references from the important historical periods in Volume I to the descriptions of individual farm elements, buildings, and structures in Volumes II and III.
- Extensive bibliographies per chapter, which include several non-Minnesota-specific sources.

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Volumes II and III focus on the descriptions and development of farm buildings, structures, landscape elements, and other features. While some of the discussions in these volumes are specific to upper Midwestern farming (e.g., bank barns), some of the information is applicable to Texas resources (e.g., drainage features, erosion control structures, and storage facilities). Each chapter in Volumes II and III focuses on individual resource types, and, as in Volume I, there are extensive bibliographies at the end of each chapter. As a result, for reconnaissance-level surveys, Texas researchers could use these volumes to establish a broader understanding of resource types that they may encounter during fieldwork. For intensive-level surveys, Texas researchers may find the sources listed in the bibliographies to be helpful.

Pennsylvania

Granger, Sally. *Agricultural Resources of Pennsylvania, c1700-1960 Multiple Property Documentation Form*. National Register of Historic Places, 2012 Available at http://www.portal.state.pa.us/portal/server.pt/community/pennsylvania%27s_agricultural_history/2584.

The Pennsylvania agricultural study is a Multiple Property Documentation (MPD) Form and is provided at the Pennsylvania Historical and Museum Commission's website. Section E (historic context) of the MPD cover document is divided into separate files on the internet site – one that includes the historic context for the entire state before 1840 and several files containing post-1840 histories by region. Much of this information may not be applicable for identifying, evaluating, and researching Texas agriculture; however, the property type and registration requirement section (Section F) of the MPD is helpful in assessing Texas resources. The MPD not only outlines how to assess a property's significance, but it guides researchers on how to assess cultural patterns (including layering of multiple cultural influences) and historical patterns (including social organization).

Since the study is an MPD, the registration requirements are very specific to Pennsylvania resources, particularly for Criterion A, and they are divided by region. The guidance on what qualifies under Criterion C is more applicable to resources outside of Pennsylvania; however, examples and illustrations are Pennsylvania-specific. The statement of integrity included in the MPD also includes general guidance for evaluating agricultural properties that may be applicable to the evaluation of Texas resources. Since the registration requirements/evaluation methodology is the most applicable portion of the Pennsylvania study, this document can be referenced when completing reconnaissance- and intensive-level surveys evaluating individual resources and rural historic landscapes.

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South Dakota

Brooks, Allyson and Steph Jacon. *Homesteading and Agricultural Development Context*. Vermillion, South Dakota: South Dakota State Historic Preservation Center, 1994.

Allyson Brooks and Steph Jacon authored the historic context for agricultural properties in South Dakota for the South Dakota State Historic Preservation Center in 1994. This study, which is focused on South Dakota's homesteading and agricultural history, is divided into three main sections: 1) a chronological context of South Dakota's farming and ranching history through 1940, 2) NRHP evaluation methodology, and 3) property type descriptions and analysis.

The first section of the Brooks and Jacon context provides some information about national trends in the development of agriculture and agricultural properties in the United States. This includes information on laws, economics, and equipment innovations at the national level. The information on cattle ranching history is particularly useful because much of the information may be applicable to ranching in any other state. The second section of the context outlines the NRHP criteria and integrity considerations for agricultural properties in South Dakota. None of the evaluation methodology was particularly innovative or unique. For example, under significance, the authors noted the important historical themes under which agricultural properties could be determined eligible for Criterion A (some of which were outlined in the historic context), but there was no discussion of what would make a property have significant associations under Criterion A. The last section of the document includes a very brief property type analysis, with a short description of each property type (nearly all were building types) and examples of properties in South Dakota and their survey numbers. While some information could aid Texas researchers in their overall understanding of national development trends, this study would likely only help researchers with reconnaissance-level surveys.

CHAPTER 5: ACQUIRING INFORMATION USEFUL TO RECONNAISSANCE- AND INTENSIVE-LEVEL SURVEYS

Knowing where to go to do historical research, how to identify data relevant to reconnaissance- and intensive-level surveys, how to analyze and use the data in developing historic contexts, and facilitating an understanding of agricultural properties and landscapes are all important aspects of conducting successful historical research. Such research supports fieldwork, property type development, NRHP evaluations, and development of historic contexts that are part of the work associated with surveys.

The mechanics of doing research in support of these tasks can be highly individualistic. In addition, some historical sources are more appropriate to intensive-level surveys than to reconnaissance-level surveys (see *Table 2-1*). Regardless, historians should be sufficiently familiar with the repositories and major collections in Chapter 1, historical source types described in Chapters 2 and 3, and secondary literature described in *Appendix B* to develop a research design and preliminary historic context, identify likely periods of significance and property types, and develop a field work methodology preliminary to actual fieldwork.

Some amount of research in county records may be helpful during a reconnaissance-level effort (specifically appraisal district records and maps and plats located in the office of the county clerk). However, more extensive use of other county records described in Chapter 1 (Repositories and Collections Descriptions) and *Appendix C* (How to Use Legal Records) usually is restricted to intensive-level surveys.

Specific examples of the uses of the records described in this *Research Guide* appear in Section 7, Case Studies. These Case Studies include sample reconnaissance-level, intensive-level with right-of-entry, and intensive-level without right-of-entry projects.

APPENDIX A: REPOSITORY AND COLLECTIONS INFORMATION

Texas Collection, Baylor University

The Texas Collection at the Carroll Library serves as the archive for Baylor University. It focuses on the political, economic, and social history of Waco and Central Texas specifically, and Texas in general. The Collection has two main divisions; the Library Division and the Archives Division, and includes periodicals, newsletters, and newspaper clippings. The collection also includes family papers of farm and ranch operators, as well as oral histories.

Website: <http://www.baylor.edu/lib/texas>

Location: Carroll Library Building, Baylor University, 1429 South 5th Street, Waco, Texas 76798-7142

Campus Map: <http://www.baylor.edu/map/>

Parking: Visitors must obtain a guest parking permit from the Parking Services office located in Robinson Tower. Reserved visitor parking is available behind the Hankamer School of Business on 4th and Speight streets.

Contact Information: Non-Baylor researchers are encouraged to contact library staff before visiting to discuss the scope of the project and research.

Library and Research Room Hours: Monday-Friday 8:15 am – 5:00 pm

Phone: 254/710-1268

Director: John Wilson, John_Wilson@baylor.edu

Coordinator for User and Access Services: Amie Oliver, Amie_Oliver@baylor.edu

Texas A&M University Libraries

The Texas A&M Library system in College Station includes two libraries; the Cushing Memorial Library and Archives which holds primary sources and the Sterling C. Evans Library, which holds secondary sources pertaining to agricultural history.

Cushing Memorial Library and Archives

In addition to a large range of agriculture-related published materials (a large collection that includes ranch management-related materials), the Cushing Memorial Library and Archives has county histories, ranching collections and papers relating mostly to South Texas, a collection of Charles Goodnight letters, a large volume of material related to the Agricultural Experiment Stations and Agricultural Extension Service, and some manuscript collections that have parts and pieces related to agriculture (most date from the 1890s to the modern era, but there are a few earlier ones).

Website: <http://cushing.library.tamu.edu>

Location: Attached to the Sterling C. Evans Library, facing the Academic Building on the Texas A&M campus, College Station, Texas 77843.

Campus Map: <http://cushing.library.tamu.edu/about/directions>

Parking: Visitors can park in the Central Campus Parking Garage next to the Library Annex, the University Center Garage on Joe Routt Boulevard, or in the Northside Parking Garage on University Drive. Parking information can be obtained from a parking counselor at 979/862-7275.

Contact Information: No appointments are necessary, but it is advisable to call ahead and confirm that the materials needed are on-site or to ensure that materials housed at off-site facilities have been transferred to the library.

Library Hours: Monday-Friday 8:00 am – 6:00 pm, Saturday 9:00 am – 1:00 pm

Phone: 979/845-1951

Coordinator of Research Services: Cait Coker, CCoker@library.tamu.edu

Interim Director of Cushing Memorial Library and Archives: Larry Mitchell,
j-mitchell@library.tamu.edu

Sterling C. Evans Library

This is the university's main library and it features general collections as well as state and federal government documents. The Evans Library also houses the Map and GIS Collections and Services.

Website: <http://library.tamu.edu/about/general-information>

Location: 400 Spence Street, Texas A&M campus, College Station, Texas 77843

Campus Map: <http://library.tamu.edu/about/directions/evans-library-annex>

Parking: Visitors can park in the Central Campus Parking Garage next to the Library Annex, the University Center Garage on Joe Routt Boulevard, or in the Northside Parking Garage on University Drive. Parking information can be obtained from a parking counselor at 979/862-7275.

Contact Information: No appointments are necessary, but it is advisable to call ahead and confirm that the materials needed are on-site or to ensure that materials housed at off-site facilities have been transferred to the library.

Library Hours: Monday-Thursday 7:00 am – midnight, Friday 7:00 am – 9:00 pm,

Saturday 9:00 am – 9:00 pm, Sunday 9:00 am – midnight

General Phone: 979/845-3731

Map and GIS Collections and Services: 979/845-1024, maps-gis@library.tamu.edu

The University of Texas Libraries

The University of Texas Library system in Austin includes the university's main research library, the Perry-Castaneda Library, as well as research repositories such as the Dolph Briscoe Center for American History.

The Perry-Castaneda Library (PCL)

The Perry-Castaneda Library (PCL) is the University of Texas at Austin's main research library. The library's holdings include books, journals, dissertations and theses, and other items covering all subject fields. The PCL also houses an expansive microform and map collection.

Website: <http://www.lib.utexas.edu/pcl/>

Location: 101 E. 21st Street, Austin, Texas 78705, located at the southwest corner of 21st Street and Speedway.

Campus Map: <http://www.lib.utexas.edu/pcl/about/maps.html>

Parking: There is no free visitor parking on the university's main campus. Visitors are advised to park in university parking garages for a fee, or to use off-campus street parking. A list of university parking garages can be found here: <http://www.utexas.edu/parking/parking/garages/index.php>.

Contact Information: The PCL is open to the public, but hours are restricted to those with university affiliation after 10:00 pm. It is advisable to check hours beforehand.

Library Hours: Monday-Thursday 7:00 am – 2:00 am, Friday 7:00 am – 11:00 pm,

Saturday 9:00 am – 11:00 pm, Sunday noon – 2:00 am

Information and Research Help Desk: 512/495-4250

Map Librarian: Paul Rascoe, 512/495-4262, prascoe@mail.utexas.edu

The Dolph Briscoe Center for American History (CAH)

The CAH research materials include archives and manuscripts, scrapbooks, newspapers, periodicals, theses and dissertations, photographs, and vertical files for a wide variety of subjects.

Website: <http://www.cah.utexas.edu/>

Location: 2313 Red River Street, Sid Richardson Hall, Room 2.106, Austin, Texas 78705

Campus Map: <http://www.cah.utexas.edu/about/locations.php>

Parking: Free parking for CAH researchers can be found in the LBJ Library Parking lot, off of Red River Street and just east of the CAH. You will receive a daily parking pass from the CAH Information Desk, which you must return to your car and display.

Contact Information: No appointments are necessary for researching at the CAH, but it is advisable to call beforehand to discuss the scope of the project and research.

Library Hours: Monday-Friday 10:00 am – 5:00 pm, Saturday 9:00 am – 2:00 pm (closed during Home UT football games)

Reference Desk: 512/495-4532

Information Desk: 512/495-4518

Texas Department of Agriculture

The Texas Department of Agriculture holds original records relating to the Department's Family Land Heritage Program.

Website: <http://www.texasagriculture.gov/Home.aspx>

Location: 1700 N. Congress, 11th Floor, Austin, Texas 78701

Contact Information: The Department of Agriculture is open to the public, but it is advisable to first contact the Public Information Office to inquire about the Family Land Heritage Program.

Public Information Office: 512/463-4075, email Pub.Info@TexasAgriculture.gov

Texas State Library and Archives Commission

The Texas State Library and Archives houses an extensive collection of Texas government and history archives. Archives include photographs, miscellaneous studies, federal census schedules, county tax rolls, and records of the Department of Agriculture.

Website: <https://www.tsl.state.tx.us/>

Location: The Lorenzo de Zavala State Archives and Library Building, 1201 Brazos Street in downtown Austin, west of the State Capitol.

Map: <https://www.tsl.state.tx.us/sites/default/files/public/tslac/landing/images/tslacmap.gif>

Parking: Parking is available in the Capitol Visitors Parking Garage between 12th, 13th, Trinity, and San Jacinto streets. The first two hours are free.

Contact Information: No appointments necessary.

Hours: Monday- Friday 8:00 am – 5:00 pm

Texas State Archives: 512/463-5480, archinfo@tsl.state.tx.us

Genealogy Collection: 512/463-5463, geninfo@tsl.state.tx.us

Texas Historical Commission

The Texas Historical Commission (THC) is the state agency for historic preservation. The agency maintains Archeology, Architecture, Community Heritage Development, History Programs, Historic Sites, and Public Information and Education Divisions. The THC also houses a library that contains cultural resource survey reports, maps, slides and photos of state historic sites and buildings, city and county histories, periodicals, and National Register nominations.

Website: <http://www.thc.state.tx.us/thclibrary/libdefault.shtml>

Location: The library is housed in the Gethsemane Luthern Church building at the THC, located at 1510 N. Congress Avenue in downtown Austin, one block north of the State Capitol.

Parking: Metered street parking is available.

Contact Information: The THC Library is an appointment-only facility. The appropriate Division should be contacted to arrange an appointment. The History Programs should be contacted if looking for National Register or Recorded Texas Historical Landmark files, oral histories, or city and county histories. The Division of Architecture should be contacted if researching buildings.

History Programs: 512/463-5853

Architecture Division: 512/463-6094

To obtain copies of individual National Register nominations, call 202/354-1496, or email nr_references@nps.gov.

APPENDIX B: ANNOTATED BIBLIOGRAPHY

Agricultural History and Related Topics (Published; General, Statistics, Trends, Cultural Analyses; U.S., Texas)

Agricultural Engineering: The Journal of the American Society of Agricultural Engineers (1920-)

The Society of Agricultural Engineers was organized in 1907 at the University of Wisconsin by a group of instructors in agricultural engineering from several state agricultural colleges. They identified the need for an organization “to promote the art and science of engineering as applied to agriculture. . . .” The scope of the Society’s activities included the following headings: farm power and operating equipment, farm structures (buildings and other structures and related equipment), farm sanitation (water supply; sewage disposal; light, heating and ventilating of farm buildings; and related equipment), land reclamation (drainage, irrigation, land clearing, etc., and related structures and equipment), and education.

The Society published a journal, *Agricultural Engineering*, that included articles focusing on farming predominantly, and dairying secondarily; articles addressed all aspects of agriculture associated with those activities. Subdivisions of the Society included a Farm Structures Division, which published articles in the journal pertaining to buildings. Typically, these might focus on the cost of construction, descriptions of specialized structures, or expressions of concern about the typical conditions of farm residences. One article about low cost housing in rural areas included a bibliography that cited studies such as the farm housing survey conducted by the Bureau of Home Economics, U.S. Department of Agriculture and published in 1939; Deane G. Carter’s study of rural housing, focused on Arkansas examples; and J. C. Wooley’s study of farm buildings in northeast Missouri. Other articles focused on the functional relationship between the mechanization of farm equipment and farm building design and the disconnect that frequently occurred. A paper published in March 1945 by the head of the division of farm structures, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U.S. Department of Agriculture, included a figure that identified the types of farm buildings according to function (farmhouses, buildings for livestock, buildings for product storage, buildings for crop production, buildings for processing, buildings for equipment and supplies, miscellaneous structures, and infrastructure associated with farm utilities. (UT-A)¹

American Association for Agricultural Engineering and Vocational Agriculture
1969 *Farm Utility Buildings: Designs, Materials, Plans*. N.p., Athens, Georgia.² (TAMU)

¹ BU=Baylor University, TAMU=Texas A&M University, TDA=Texas Department of Agriculture, THC=Texas Historical Commission, TSLAC=Texas State Library and Archives Commission, UT-A= The University of Texas at Austin.

² Some publications and other source materials were not available to the authors for review and are not annotated. They are included in the bibliography because their titles suggested that they might be relevant to the study topic and area.

Anderson, Carl G., and D. S. Moore

- 1971 *Production and Production Requirements, Costs and Expected Returns for Crop and Livestock Enterprises: Level Blackland Soils of the Central Blackland Prairie of Texas*. Texas Agricultural Experiment Station, College Station.

The authors seek to provide farmers with information that will help them make the “most profitable production and investment decisions on the more level soils of the Central Blackland Prairie. . . .” They provide detailed data about production requirements and costs and returns for major crop and livestock activities in a budget format. Associated structures and other facilities are listed for a variety of livestock. (TAMU)

Anderson, Carl G., and D. S. Moore

- 1972 *Economies of Size on Farms in the Blackland Area of Texas*. Texas Agricultural Experiment Station. Texas A&M University, College Station.

Anderson and Moore analyzed numerous farms in the Central Texas Blackland area and concluded that, using the 1964 census to establish the sizes of farms in the area, a substantial number of the farms were less than the size required to achieve maximum efficiency. More than 96% were smaller than 1,000 acres, and more than 87% were smaller than 500 acres. Operators of such units were “likely to find increasing pressure to adjust to larger and more efficient units in the future.” (TAMU)

Available electronically: <http://hdl.handle.net/1969.1/92990>.

Atkins, Irvin Milburn

- 1980 *A History of Small Grain Crops in Texas: Wheat, Oats, Barley, Rye 1582-1976*. Texas Agricultural Experiment Station Bulletin 1301. Texas Agricultural Experiment Station, College Station, Texas

Atkins summarizes fifty years of research into the history of small grains in Texas. His study includes a history of the introduction of wheat to the Americas and during the Texas Colonial period, descriptions of acreages of wheat in Texas, descriptions of varieties grown, associated hazards, milling, and efforts to improve crops. (TAMU)

Available electronically: <http://hdl.handle.net/1969.1/25896>.

Barre, H. J., and Sammet, L. L.

- 1950 *Farm Structures*. John Wiley & Sons, Inc., New York.

The book is directed towards students of agricultural engineering and is a technical treatment of issues to be considered in the planning and construction of specific farm buildings and structures. (TAMU)

Biggs, Archie A., and Joan C. Courtless

- 1961 *Evaluation of Construction, Materials, and Livability of Five Expansible Farmhouses*. ARS 42-45. Agricultural Research Service, U.S. Department of Agriculture, Washington, D.C.

The authors report on the results of the construction of five expansible farmhouses that was started at the Agricultural Research Center in Beltsville, Maryland, in 1952. The houses were built primarily for dairy workers. Each house type is described and evaluated by the occupants and USDA employees. (TAMU)

Bizzell, William Bennett

- 1921 *Farm Tenantry in the United States: A Study of the Historical Development of Farm Tenantry and its Economic and Social Consequences on Rural Welfare with Special Reference to Conditions in the South and Southwest*. Texas Agricultural Experiment Station Bulletin No. 278. Agricultural and Mechanical College of Texas, College Station.

This study of rural sociology was intended to supplement the work of other specialists in the physical and biological sciences associated with agriculture. The publication reflects an early twentieth-century, broad national concern with farm tenantry. Bizzell provides an historic and economic background of tenantry in the United States, analyzes the social and economic factors, and proposes a solution to the farm tenantry problem. (TAMU)

Available electronically: <http://hdl.handle.net/1969.1/3632>.

- 1924 *Rural Texas*. The Macmillan Company, New York.

This is an analysis of the agricultural resources and rural life conditions in Texas. It discusses state laws having an impact on early twentieth-century agricultural production through regulation; devotes a chapter to cotton production, mapping its distribution; and discusses all forms of animal industry, identifying most favored breeds. Bizzell explains the impacts of rail, water, and highway transportation and infrastructure; agricultural finance and marketing; and agricultural organizations and fairs on the agricultural economy. (TSLAC)

Blalock, James, and Robert Metzger

- 1989 *Cotton Production in the Blackland Prairie and Grand Prairie*. Texas Agricultural Extension Service, Texas A&M University System, College Station. (TAMU)

Bonnen, C. A., and F. F. Elliott

- 1931 *Type-of-Farming Areas in Texas*. Texas Agriculture Experiment Station Bulletin No. 427. Agricultural and Mechanical College of Texas, College Station.

Bonnen and Elliott present a study of Texas agriculture based on the different types-of-farming areas. They describe physical, biological, and economic factors in the development of agriculture in the state and describe the geographical distribution of more than seven crops and five types of livestock. They map the crop and livestock systems and classify and describe the farms and farming systems in each area, including the Black Prairie (Area 15). (TAMU)

Available electronically: <http://hdl.handle.net/1969.1/86169>.

The 1931 publication was followed in 1937 by C. A. Bonnen's and B. H. Thibodeaux's *A Description of the Agriculture and Type-of-Farming Areas in Texas*. (TAMU)

Available electronically: <http://hdl.handle.net/1969.1/4474>.

Bonnen, C. A., and B. H. Thibodeaux

1937 *A Description of the Agriculture and Type-of-Farming Areas in Texas*. Texas Agriculture Experiment Station Bulletin No. 544. Agricultural and Mechanical College of Texas, College Station.

The authors point out that Texas in 1937 was primarily an agricultural state, with about 40% of all residents living on farms in 1930. They identified cotton as the leading crop and cattle as second to cotton as a source of cash farm income, comprising more than half of all livestock kept on farms. By means of maps and charts, the authors show the distribution of crops and livestock in the state and their relative proportions by county. They also divide the state into eighteen major type-of-farming areas based on differences in soils, surface, and climate; on the types and proportions of agricultural products; and on prevailing production practices. (TAMU)

Bonnen's and Thibodeaux's work was followed by a publication by Bonnen in 1960 that revised Bulletin 544 and described what Bonnen described as the drastic changes that had taken place in Texas agriculture. Like the 1937 work, the 1960 study was divided into physical, biological, economic, and sociological factors influencing agriculture; descriptions of land use in Texas (distribution of cropland and distribution of livestock and production trends), and description of the types-of-farming areas, including the Edwards Plateau and Central Basin, Grand Prairie, and Blackland. (TAMU)

Available electronically: <http://hdl.handle.net/1969.1/87884>.

Boykin, Calvin Clay

1956 *Factors Affecting Conservation on Share-Rented Farms, Texas Blackland Prairie*. Texas Agricultural Experiment Station. Progress Report 1879. Texas Agricultural Experiment Station, College Station. (TAMU)

Boykin, Calvin Clay, and Nathan K. Forrest

1971 *Economic and Operational Characteristics of Livestock Ranches, Edwards Plateau and Central Basin of Texas*. Texas Agricultural Experiment Station. Miscellaneous Publication 978. Texas Agricultural Experiment Station, Texas A&M University, College Station. (TAMU)

Bradley, Virginia

- 1949 *Functional Patterns in the Guadalupe Counties of the Edwards Plateau*. MA thesis, University of Chicago, Chicago, Illinois.

Focusing on the Guadalupe River counties of Comal, Kendall, and Kerr, and on the blackland prairie and Edwards Plateau regions, Bradley analyzes the inherent characteristics of the areas in cultural forms and natural features. Her objects are to discover relationships between the natural features and cultural forms, and to ascertain the extent to which the interrelated cultural and natural patterns serve the major functions of the study area. She conducted field research to record natural and cultural features, included major and minor towns in her sample, and took 470 photographs as a pictorial record. She analyzed the ranching and farm patterns of the study area, described typical agricultural units, and noted changes that have been ongoing since initial settlement. (UT-A)

Breeder's Gazette, The

- 1911 *Farm Buildings: A Compilation of Plans for General Farm Barns, Cattle Barns, Dairy Barns, Horse Barns, Sheep Folds, Swine Pens, Poultry Houses, Silos, Feeding Racks, Farm Gates, Sheds, Portable Fences, Concrete Construction, Handy Devices, Etc.* The Breeder's Gazette, Chicago.

The publication is a compilation of the best plans contributed to *The Breeder's Gazette* by farmers and stockmen. The contributions are heavily weighted to the Midwest but include examples from the Upper South and West. (TAMU)

Brown, Charles W., and Clarence A. Moore

- 1963 *On-Farm Storage and Disposal of Sorghum Grain*. Texas Agricultural Experiment Station. Texas A&M University, College Station.

The authors discuss the prevalence of on-farm storage in north-central Texas, which was one of three areas the authors surveyed. They also discuss trends in sorghum cultivation and its connections with expanding beef production and feeding operations. (TAMU)

Available electronically: <http://hdl.handle.net/1969.1/90455>.

Buechel, F. A.

- 1936 *Dairying Manufacturing in Texas*. The University of Texas, Austin. (UT-A)

- 1942 *Graphic and Statistical Summary of the Dairy Industry with Special Reference to Texas, Preliminary Report*. Bureau of Business Research, The University of Texas, Austin. (UT-A)

Building on Buechel (1936) and Buechel and Johnson (1938), and reporting from dairy manufacturers, Buechel places the Texas dairy industry in international and national contexts, focusing on the period 1899-1940 and extending some of the data presented in Johnson (1933) an additional decade. (UT-A)

Buechel, F. A., and Elmer H. Johnson

1938 *Manufacture of Dairy Products in Texas, Preliminary Report*. The University of Texas, Austin.

The authors include an analysis of the geography of Texas because of the relationship between geography and the dairy manufacturing industry, building on earlier work by Johnson. Johnson also ties the development of dairying to the rise and spread of urban areas and analyzes the geography of the dairy industry in Texas, pointing to the importance of the Blackland and Grand Prairie regions. Buechel discusses trends and associated factors in the industry. An appendix provides the names of dairy manufacturing plants in Texas by city and the types of dairy products associated with each. (UT-A)

Bureau of Agricultural Economics and Texas Agricultural Experiment Station

1943 *Wartime Capacity of Texas Agriculture*. Texas Agricultural Experiment Station, College Station.

The Bureau and Station note the demands that war place on agricultural resources and examine resources used for intensive crop production to determine what maximum production might be attained. They discuss changes in feed production and livestock numbers; commodity price relationships; farm labor, machinery, and fertilizer needs; and resources for both crop and livestock production. They then discuss wartime capacity by adjustment areas, including the Black Prairie Area, where they note that the establishment of the Agricultural Adjustment programs resulted in a shift from cotton production to livestock. They summarize the state of agriculture generally in the thirty-three county area. (TAMU)

Carlson, Paul H.

1982 *Texas Woollybacks: The Range Sheep and Goat Industry*. Texas A&M University Press, College Station.

Carlson takes Towne's and Wentworth's landmark history, focuses it on Texas, and expands it to include goats in greater detail. Of particular interest to historians researching agricultural history in the Blackland Prairie region is the information Carlson provides about early goat raisers in Hays County (W. W. Haupt) and his discussion about the impact of the Civil War on the industry. A drawback is his focus on south and southwest Texas, which fails to acknowledge the widespread popularity of sheep raising in Central Texas by the 1850s. (UT-A)

Carter, Deane G.

1954 *Farm Buildings*. Wiley, New York.

Building on earlier work, Carter discusses farm and farmstead planning and specific types of structures in the light of current trends and factors that influence farm building development. There are numerous illustrations. (TAMU)

Carter, Deane G., and The Late W. A. Foster
1941 *Farm Buildings*. J. Wiley, New York.

The authors provide comparative information about the value of farm buildings per farm and the average value of dwellings per farm for all states. They identify and discuss topics pertinent to the design of farm buildings and provide pictures and plans for numerous building types. See also Foster and Carter 1922, 1928. (TAMU)

Central Texas Council of Governments Staff, compiler
1970 *Bell County, Texas, Conservation Needs Inventory*. Central Texas Council of Governments, Belton, Texas.

The publication provides data, updated from a 1958 inventory, that reflect land use changes through 1967. Tables show cropland, pasture, range, forest, and other land acreages. (TAMU)

Cleaveland, Malcolm, Todd H. Votteler, Daniel K. Stahle, Richard C. Casteel, and Jay L. Banner
2011 Extended Chronology of Drought in South Central, Southeastern and West Texas. *Texas Water Journal*. Vol. 2, No. 1 (December), pp. 54-96.

This landmark study updates the work published by Stahle and Cleaveland in 1988 that reconstructed and analyzed Texas drought history from 1698 to 1980 by extending the chronology back to 1500. The authors refine their previous statistical and historical characterizations of extreme events such as the extent, duration, and severity of multi-year droughts. Tables and graphs identify key drought events that would have had significant impacts on Texas agriculture. Importantly, their work provides clues to historians seeking explanations for variations in crop and livestock yields during the nineteenth and twentieth centuries that go beyond the common explanations based on economic and political policies.

Cochrane, Willard W.
1993 *The Development of American Agriculture; a Historical Analysis, Second Edition*. University of Minnesota Press, Minneapolis.

Cochran's study provides an overview of agricultural development in the United States and a broad context for the history of development, beginning in the Colonial period and ending with the U.S. and world markets (1990). He describes the effects of commercialization in the mid-nineteenth century and of the technological revolution in the mid-twentieth century. Importantly, he analyzes forces that had an impact on the development of agriculture and resulted in structural changes in the industry: abundant land; farm mechanization; technological advances; infrastructure construction, particularly of transportation systems; and research and education. (UT-A)

Crawford, G. L.
1927 *An Economic Study of the Dairy Industry in Texas*. Texas Agricultural Experiment Station Bulletin No. 358. Agricultural and Mechanical College of Texas, College Station, Texas.

Crawford compares statistics from 1870 and 1920 to record the decrease in numbers of dairy cows per person and increase in milk production per cow. He describes a trend away from small

creameries to centralizers and sweet-cream creameries and notes the local character of the ice cream business. He also analyzes methods used to market and transport various dairy products. Maps record production of milk by county and distribution of creameries. (TAMU)

Division of Public Welfare, Department of Extension

1915 *Studies in Farm Tenancy in Texas*. Bulletin of The University of Texas No. 21. n.p.

This study looks at the economics of the farm tenancy system in Texas, describing the personal property of tenants, sources of credit and capital, chattel mortgage and the one-crop system, and the role of livestock. Maps depict the locations of tenant farmers, counties where tenancy had increased and decreased between 1900 and 1910. (UT-A)

Ekblaw, K. J. T.

1920 *Farm Structures*. The Macmillan Company, New York.

The author directs his publication to students and the progressive farmer. He intends to present information about buildings that fit "ordinary conditions." He begins with a description of building materials and construction techniques, and presents typical plans of various farm buildings, recognizing that buildings problems are largely local. As a result, he aims to provide typical plans that are widely usable. He discusses a wide variety of buildings that would have been part of a farmstead and then writes about ventilation, lighting, heating, water supply, and plumbing and sewage disposal. (TAMU)

Farm Placement Service, United States Employment Service]

1938 *Survey of Farm Placement in Texas, 1936-1937*. [Texas State Employment Service, Austin].

The report presents a picture of the operations and development of the Farm Placement Service in the organization of the labor market in 1936-1937. The report notes that recent years had seen a leveling of the importance of the agricultural industry in comparison with other industries, most notably oil, gas, and manufacturing, even while cotton provided more employment, *per se*. The Service points to the importance of migratory labor in the agricultural industry, and the need to organize, direct, and control movements of transient farm labor. A map depicts the principal migratory labor routes throughout the state. (UT-A)

Foster, W. A., and Deane G. Carter

1922 *Farm Buildings*. John Wiley, New York.

Foster and Carter provide detailed information about the design and construction of various types of barns, hog houses, poultry houses, grain storage buildings, silos, implement and machine shelters. There are numerous illustrations. (TAMU)

1928 *Farm Buildings*. J. Wiley, New York.

The publication deals with the location, planning, construction, and repair of farm buildings and reflects the appearance of new types of buildings, new materials, and new construction technologies. It discusses changes in agricultural methods that affect farm buildings, including the increasing availability of expensive farm machinery. (TAMU)

Freeman, Billy G., R. H. Rogers, and D. S. Moore

- 1965 *Production and Production Requirements, Costs and Expected Returns for Crop and Livestock Enterprises: Rolling Blackland Soils of the Central Blackland Prairie of Texas*. Miscellaneous Publications 752. Texas Agricultural Experiment Station, College Station.

The purpose of the study is to “present information that will help farmers select the most profitable combination of enterprises and practices on rolling soils of the Central Blackland Prairie of Texas.” The areas of applicability are the rolling Houston, Austin and Bell clay, and clay loam soils in Hill, Navarro, McLennan, Limestone, Falls, Bell, and Milam counties. The authors enumerate the benefits of advanced management consisting of: appropriate rates of fertilizer, use of cropping system or rotation, control of cotton insects, and weed control and timeliness of operations. They also discuss livestock budgets and marketing of grain and forage. (TAMU)

French, Thomas E., and Frederick W. Ives

- 1915 *Agricultural Drawing and the Design of Farm Structures*. McGraw-Hill Book Company, Inc., New York.

The authors provide numerous examples of drawings of various farm buildings and structures, including sheep racks, barns, hog cots, poultry houses, implement and tool sheds, cribs, septic tanks, fences, paddocks, pens, gates, and farmhouses. (TAMU)

Gabbard, L. P., and F. R. Jones

- 1927 *Large-Scale Cotton Production in Texas*. Texas Agricultural Experiment Station Bulletin No. 362. Agricultural and Mechanical College of Texas, College Station.

While the study uses statistics from studies near Corpus Christi and San Angelo, the basic premises are broadly applicable: that the recent introduction of tractor power and improved farm machinery, new methods in cotton harvesting, and improvements in the ginning process have had dramatic impacts on cotton production. The relative efficiencies of tractor and animal power are analyzed as are the effects of power and machinery on labor utilization. The authors discuss common field practices associated with cotton growing. They also describe the practice of sledding. (TAMU)

Gabbard, L. P., J. R. Hutson, and T. L. Gaston, Jr.

- 1929 *Systems of Farming for the Black Waxy Prairie Belt of Texas*. Texas Agricultural Experiment Station Bulletin No. 395. Agricultural and Mechanical College of Texas, College Station.

Building on an increasing recognition of the benefits of crop rotation, the authors describe well-balanced systems of farming (including crops other than cotton and livestock) and their economic benefits. They reference *Texas Agricultural Experiment Station Bulletin No. 327*, which provided the results of a study of 500 farms in the black waxy prairie belt. In the earlier study, approximately 93% of the total land area was cultivated, and most of the animals were work stock. The authors describe a variety of systems for farms of varying sizes, from 50- to 200-acres units. (TAMU)

Available electronically at: <http://hdl.handle.net/1969.1/4525>.

Gray, Harold E.

1955 *Farm Service Buildings*. McGraw-Hill, New York.

Gray's book is part of the McGraw-Hill series in agricultural engineering. (See also Wooley 1952.) He provides an overview of the history of farm service buildings development in the United States, the economic influences on the buildings, and trends in the farming business. He also mentions problems with farm building design that have been based on the tendency to build for reasons other than actual studies of what is needed, and the tendency to build structures that are not readily adaptable to change, such as that associated with machinery. A map shows Texas as part of the Southern Regional Plan Service, which was developed as a result of cooperation of federal and state agencies for the purposes of standardizing farm building construction and disseminating plans and information. A wide range of specific-use buildings is discussed and illustrated. (TAMU)

Hale, Fred, and H. P. Smith

1932 *New Developments in Hog Houses and Equipment*. Texas Agricultural Experiment Station, Bulletin No. 486. Agricultural and Mechanical College of Texas, College Station.

Hale and Smith provide plans, specifications, and photographs for a variety of hog houses, breeding crates, a covered water trough, adjustable self-feeders, weighing and shipping crates, a load chute, hog-killing equipment, and a smoke house. All take into consideration conditions in Texas. (TAMU)

Halsted, Byron David

1917 *Barn Plans and Outbuildings*. Orange Judd Company, New York.

This profusely illustrated publication provides information about general, cattle, dairy, sheep, and horse barns; shelters; sheds; piggeries; poultry houses; corn houses and cribs; dairy houses, creameries, and cheese factories; spring houses; granaries; smoke houses; kennels; silos; root cellars and houses; and miscellaneous farm buildings. (TAMU)

Harvey, R. N., J. C. Olsen, F. W. Kazmeier, and T. J. Conway

1917 *Poultry Houses and Poultry Equipment for Texas*. Texas Agricultural Experiment Station Bulletin No. 207. Von Boeckmann-Jones Co., Printers, Austin, Texas.

In response to significant public demand, the authors provide plans and specifications for poultry houses that include a variety of types. They describe equipment, feed hoppers, and water containers. Data about materials and associated expenses are presented in tables. (TAMU)

Houston, East and West Texas Railway

1902 *Industrial Development, Central East Texas, The Fruit Belt of the State, Its Soils, Products and Industries*. Passenger Department, Houston, East & West Texas Railway, Houston, Texas.

This generally promotional publication also includes brief sketches of agriculture in the counties traversed by the railway, all of which are east of Central Texas and in Louisiana. (UT-A)

Johnson, Elmer H.

- 1933 *The Basis of the Commercial and Industrial Development of Texas: A Study of the Regional Development of Texas Resources*. The University of Texas Bulletin No. 3309. The University of Texas at Austin.

This baseline identification of natural regions, and crop and livestock reporting districts, as well as mapping of census data documenting a wide variety of agricultural products between 1899 and 1930 provided the tools used by all other similar studies listed in this bibliography. Maps of acreages by crops that depict data in cartographic form are useful for graphically translating raw census numbers and representing information presented in textual format. Equivalent maps are provided for livestock. Population distribution maps for 1870-1930 provide helpful supplemental information. (UT-A)

Johnson, LeRoy

- 2000 *Life and Death as Seen at the Bessie Bruze Site (41WM13) on the Blackland Prairie of Williamson County, Texas*. Texas Department of Transportation, Environmental Affairs Division, Austin.

Johnston, J. R.

- 1951 *Research Sets Patterns for the Central Blacklands*. Texas Agricultural Experiment Station Miscellaneous Publication 65. Texas Agricultural Experiment Station, College Station. (TAMU)

Jordan, Terry G.

- 1981 *Trails to Texas: Southern Roots of Western Cattle Ranching*. University of Nebraska Press, Lincoln.

Part of the usefulness of this work is the balance it provides to an earlier, prevalent view that the ranching tradition in Texas was rooted solely in the traditions of Spain and Mexico. Jordan instead stresses the Anglo-American (specifically southern) heritage of cattle herding prior to immigration of southerners to Texas and the impact of that cultural heritage on an extent ranching system. (UT-A)

- 1993 *North American Cattle-Ranching Frontiers, Origins, Diffusion, and Differentiation*. University of New Mexico Press, Albuquerque.

Jordan's later work describes and analyzes the various source regions of the North American cattle industry, including the Atlantic fringe, West Indies, northern Mexico, the Carolinas, Texas, California, and the Midwest. His chapter on the Anglo-Texan ranching system describes the "Texas system" and maps its origins and spread in Texas and the western United States. It also discusses Mexican and Carolinian contributions, migration of cattle ranchers in Texas, and the collapse of the system. He documents material culture associated with the industry and provides a thorough annotated bibliography. (UT-A)

Jordan, Terry G., and Norman J. W. Thrower

- 1970 *Annals Map Supplement Number Thirteen: Population Origin Groups in Rural Texas*. *Annals of the Association of American Geographers*. Vol. 60, No. 2 (June), pp. 404-405.

Jordan combined census mining, intensive field work, and research to locate and enumerate ethnic minorities. They are presented in map format. (UT-A)

Killough, D. T., Henry Dunlavy, and H. E. Rea

- 1929 *Varieties of Cotton for the Blackland Region of Central Texas*. Texas Agricultural Experiment Station Bulletin 399. Texas A&M University, College Station.

The authors conducted a comparative study to ascertain the most profitable varieties of cotton produced in the Blackland Prairie area. They described integrated studies begun in 1912. (TAMU)

Available electronically: <http://hdl.handle.net/1969.1/4009>.

Kinsey, Winston Lee

- 1979 The Immigrant in Texas Agriculture During Reconstruction. *Agricultural History*, Vol. 53, No. 1 (January 1979), pp. 125-141.

Kinsey describes attempts to replace slave labor with European immigrant labor after the Civil War with the support of private individuals and companies, associations and societies, and the state in the form of the Texas Bureau of Immigration. He enumerates German, Czech, Scandinavian (particularly Norwegian), British, Polish, and Italian immigration that resulted in Texas's having the largest foreign-born population in the Deep South by 1880. (UT-A)

Lewis, Oscar

- 1948 *On the Edge of the Black Waxy: A Cultural Survey of Bell County, Texas*. Washington University, Saint Louis, Missouri.

Lewis discusses the history of settlement and the agricultural economy, and the cultural homogeneity of the county. Maps depict distribution of farm buildings and farm operators of German and Czech descent, while photographs and text describe farms, farming methodologies, farm architecture, and public buildings. He describes machines and other tools of production, noting the trend towards mechanization that began in the 1930s. He discusses the Elm Creek Demonstration Project, one of the largest soil conservation projects in the U.S., and the work of the SCS, which began in 1933 with establishment of four CCC camps. Finally, Lewis summarizes current population and agricultural trends. (UT-A)

Lindley, James A., and James H. Whitaker

- 1996 *Agricultural Buildings and Structures*. American Society of Agricultural Engineers, St. Joseph, Missouri.

The greatest part of the publication is about late twentieth-century agricultural building and structural design and construction. There is a brief illustrated discussion about the history of barn design and construction in the United States as well as an analysis of the ways in which mechanization and "improved cultural practices" have influenced the design of farm buildings. The authors note a shift from small multipurpose farms to large, single enterprise operations. (TAMU)

Magee, A. C.

- 1952 *Feed Reserves for Wintering Ewes on Central Texas Farms*. Texas Agricultural Experiment Station Progress Report 1470. Texas Agricultural Experiment Station, College Station.

Magee studied the impacts of a prolonged drought on sheep farmers in McLennan, Bell, and Coryell counties, using sixteen farmers as a study group. He noted the advantage that farmers with ample feed reserves enjoyed. (TAMU)

- 1954 *Cost of Shifting from Cash Crops to Dairying on Central Texas Farms*. Texas Agricultural Experiment Station Progress Report 1640. Texas Agricultural Experiment Station, College Station.

After studying twenty-four agriculturalists in McLennan, Bell, Coryell, and Bosque counties who had converted from cash crop production to dairying in the previous five years, the authors provided specific information about the costs involved in the conversion. They discussed changes in equipment, buildings, fencing, feed storage, water systems that were required, and other practical topics. They distinguished between those changes in buildings that were hired out and involved new construction versus those that involved reuse and construction by the farm owner. (TAMU)

- 1955 *Silo Construction Costs and Silage Production Practices*. Texas Agricultural Experiment Station Bulletin 798. Texas Agricultural Experiment Station, College Station.

Magee found three types of silos in common use on Blackland and Grand Prairie farms: the unlined trench, the concrete-lined trench, and the upright, all of which were illustrated. The unlined trench was the most common of the three. (TAMU)

Available electronically: <http://hdl.handle.net/1969.1/86474>.

- 1956 *Fitting Beef Cattle Into Central Texas Farming*. Texas Agricultural Experiment Station Bulletin 840. Texas Agricultural Experiment Station, College Station.

Magee discussed the relatively recent shift from cash crop production (primarily cotton and corn) to beef cattle, assisted in part by the demand for beef during World War II. He studied forty farms in McLennan, Bell, Coryell, and Bosque counties that had made the shift and described the adjustments and additional improvements that accompanied the change: remodeled sheds and barns, expansion of stock water facilities, new fencing, and feed facilities. (TAMU)

- 1957 *Goats Pay for Clearing Grand Prairie Rangelands*. Texas Agricultural Experiment Station, College Station. (TAMU)

Magee, A. C., and Ralph H. Rogers

- 1957 *Financing a Beef Cattle Enterprise on Blackland Farms*. Texas Agricultural Experiment Station Bulletin 862. Texas Agricultural Experiment Station, College Station.

The authors studied twenty-three farms in Bell and McLennan counties in 1952-1954 in which the operators obtained most of their farm income from cash crops. They noted their preference

for stocker cattle; addition of cattle increase the investment in the business of the farm substantially because of the cost of improvements, establishment of pastures where cultivated crops grew, cost of cattle, and investment in feed. (TAMU)

Available electronically: <http://hdl.handle.net/1969.1/86416>.

- 1959 *Combining Livestock with Cash Crops on Blackland Farms*. Texas Agricultural Experiment Station, College Station. (TAMU)

Magee, A. C., B. H. Stone, and C. L. Godfrey

- 1962 *Factors Affecting Cotton Yields on the Blackland Prairies*. Texas Agricultural Experiment Station Progress Report 2248. Texas Agricultural Experiment Station, College Station.

Attempting to understand why some cotton producers in Williamson, Bell, Hill, Navarro, Hunt, and Collin counties grew double the area average, the authors studied 104 farmers. They found that high producers worked better-than-average land, were more diligent in their farming practices, made substantial use of fertilizer and controlled cotton insects and root rot, had lease arrangements that favored good management, and had a slight tendency to have more formal schooling even though they were the about the same age as those with lower yields. (TAMU)

Moore, Clarence A., and A. C. Magee

- 1956 *Financing the Dairy System on a Central Blackland Farm*. Texas Agricultural Experiment Station Bulletin 837. Texas Agricultural Experiment Station, College Station.

Moore and Magee note the shift of many central Blacklands farmers from cultivation of cash crops to dairy operations. The purpose of the study is to determine the economic feasibility of such a change on a 180-acre Blackland farm. (TAMU)

Available electronically: <http://hdl.handle.net/1969.1/86582>.

Motheral, Joe

- 1944 *Recent Trends in Land Tenure in Texas*. Texas Agricultural Experiment Station Bulletin 641. Texas A&M University, College Station.

Motheral analyzed trends in tenure patterns during the 1930s and early 1940s. He noted that the third and fourth system suited to growing annual cash crops was often inadequate when cotton acreage was reduced and livestock raising emphasized. He concluded that in the 1930s farmers tended to expand the sizes of their production units, they turned to increased mechanization, and they secured government subsidies to offset income disparities. (TAMU)

Available electronically: <http://hdl.handle.net/1969.1/86313>.

Neubauer, Loren W., and Harry B. Walker

- 1961 *Farm Building Design*. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

The publication is influenced by the authors' experiences in the Midwest and California. They focus on the farmstead, showing various farmstead layouts; and on specific buildings, such as barns, poultry houses, silos, grain bins and corn cribs, multi-purpose sheds, storage and processing structures, and water supply and sewage systems. (TAMU)

Phillips, Richard E.

1981 *Farm Buildings, from Planning to Completion*. Doane-Western, St. Louis, Missouri.

Phillips discusses the initial planning involved with farm building construction and then spends the next part of the publication discussing specific building types: machinery storage, farm shops, swine confinement buildings; and buildings associated with beef production, dairying, poultry, horses, the handling of livestock, hay, silage, and grain storage, and crop growing buildings. He provides detailed information about building construction. (TAMU)

Radford, William, and David and Joan Loveless

1978 *Practical Plans for Barns, Carriage Houses, Stables & Other Country Buildings*. The Berkshire Traveller Press, Stockbridge, Massachusetts.

The authors reproduce Bradford's Barn Plan Book, which includes numerous numbered plans for prototypical barns, feed lots, cattle sheds, poultry houses, and miscellaneous farm buildings. (TAMU)

Reid, Debra Ann

2000 *Reaping a Greater Harvest: African Americans, the Extension Service, and Rural Reform in Jim Crow Texas*. Texas A&M University Press, College Station.

Reid focuses on the history of the Negro division of the Texas Agricultural Extension Service and its work in agriculture and the farm home. (UT-A)

Reynolds, E. B., and D. T. Killough

1927 *Crop Rotation in the Blackland Region of Central Texas*. Texas Agricultural Experiment Station Bulletin No. 365. Agricultural and Mechanical College of Texas, College Station.

The authors describe declines of cotton yields in the Blackland Prairie region and argue for the benefits of crop rotation. They describe the eleven years of experiments with rotation at the Temple Experiment Station and the resulting increases in crop yields. A table depicts cotton yields by decade from 1866 to 1925. (TAMU)

Sandall, Sharon K., and Robert B. McGeachin

1998 *Bibliography of Texas State and Local Agricultural Literature from 1820-1945*. Texas A&M University Libraries.

Available electronically from: <http://hdl.handle.net/1969.1/90838>.

The bibliography was compiled for the Texas state and local literature component of the United States Agriculture Information Network Preservation Project Plan, a nationally coordinated effort to preserve U.S. agricultural literature. The bibliography attempts to identify all Texas

agricultural literature published by governmental and commercial, state and local entities before 1946. The list encompasses 1,970 monographic and 685 serial titles. (TAMU)

Available electronically from: <http://hdl.handle.net/1969.1/90838>.

Sanders, Jennifer Cearley

- 2005 *Relationships Among Landowner and Land Ownership Characteristics and Participation in Conservation Programs in Central Texas*. MA thesis, Texas A&M University.

Spurred by concerns among natural resource agencies for the effects of an increasingly larger number of small rural properties, Sanders interviewed sixty landowners in four Central Texas counties in the Leon River watershed. She quantified differences in landowner characteristics, attitudes, and motivations and identified three categories that represented specific goals, attitudes and motivations regarding land ownership and agriculture and wildlife management. The three categories were Born to the Land, Agricultural Business, and Re-born to the Land. Owners in each category displayed strong ideas regarding land management, their roles as stewards of their land, and willingness to participate in natural resource conservation programs. (TAMU)

Schultz, LeRoy G., compiler

- 1986 *Barns, Stables, and Outbuildings; A World Bibliography in English, 1700-1983*. McFarland & Company, Inc., Publishers, Jefferson, North Carolina.

This bibliography provides references to publications about farm outbuildings (barns, stables, hop barns, tobacco barns, corncribs, granaries, and silos) from countries around the world. Schultz notes that “[i]t was the distribution of the farm journal (some 400 different journals were published between 1820 and 1860) that resulted in the architectural homogeneity of all farm buildings and such journals remain the best single source of the evolution of structures. They remain the best source for a building typology, including carpentry habits, building materials used, technique and theory. They also list barns and stables in such a way that local historians can trace them.” There are more than 1,800 citations for literature about barns in America. (TAMU)

Scoates, Daniels

- 1927 *Farm Buildings*. Edwards Brothers, Ann Arbor, Michigan.

Scoates’s first work includes much information about Texas agriculture, typical farmstead layout, farm building types and architecture. It appears to include information based on personal observations. (TAMU)

- 1937 *Farm Buildings*. 2 volumes. D. Scoates, College Station, Texas.

Scoates, a professor of agricultural engineering at Texas A&M and member of the American Society of Agricultural Engineers, produced a handbook and guide. Volume I deals with various farm buildings, including descriptions, details of design, and suggestions. Specific chapters discuss farm layout, types of rural architecture, and types of farm buildings (including drawings of building shapes, building roofs, building layouts, etc.). All types are identified by name. Numerous drawings and plans of southern farm houses are included. Volume II presents materials and methods of construction for landscaping (roads, paths, walks, bridges, fences, and gates). As in Volume I, specifics are provided (for framing types, construction details, lumber patterns, roofs and roofing, hardware, etc.) (TAMU)

Sharpless, Mary Rebecca

1999 *Fertile Ground, Narrow Choices: Women on Texas Cotton Farms, 1900-1940*. The University of North Carolina Press, Chapel Hill.

Sharpless analyzes the physical conditions of women's lives in the cotton South and how they coped with those conditions. She relies heavily on oral histories, supplemented by data from government publications and information from other secondary sources. (BU, UT-A, TAMU)

Sharpless, M. Rebecca, and Joe C. Yelderman, Jr., editors

1993 *The Texas Blackland Prairie: Land, History and Culture*. Baylor University, Waco, Texas.

This volume includes twenty-four articles by scholars representing a variety of disciplines, all focusing on aspects of the Blackland Prairie. These include: the physical and cultural milieu of the region, geology, water, native plants and wildlife, prehistoric populations, European exploration, Anglo-Texan experiences pre-1870, technology and its impacts in the nineteenth and twentieth centuries, the Great Depression, urban impacts, erosion, and other related topics. Each article includes a bibliography. One article (Bland and Jones) focuses on the impacts of agricultural technology in Hunt, Navarro, Falls, and Caldwell counties, 1940-1990; another article (Richardson) focuses on erosion in Hunt, Navarro, Falls, and Caldwell counties, 1920s-1990s. A third article (Taylor), provides agricultural statistics for Bell, Collin, Dallas, Hill, McLennan, and Williamson counties from 1860-1987 and for sixteen Blackland Prairie counties from 1962-1988. An all-inclusive bibliography is provided at the end of the publication. (BU, UT-A)

Shearer, Herbert A.

1917 *Farm Buildings With Plans and Descriptions*. Frederick J. Drake & Co., Publishers, Chicago.

In a publication focused on the Midwest, Shearer provides information to farmers about the different types of barn construction (old and new), dairy houses, and numerous other major and minor structures associated with farming and dairying. He provides plans. (TAMU)

Smith, R. M.

1954 *Summary of Soil and Water Conservation Research from the Blackland Experiment Station, Temple, Texas, 1942-53*. Texas Agricultural Experiment Station Bulletin 781. Texas Agricultural Experiment Station, College Station.

The author summarizes twelve years of data about runoff, erosion, and related measurements at the Blackland Experiment Station. He specifies that, based on research, the Nichols (drainage) type terrace is the preferred standard based on terrace design worked out in SCS Operations practices. Cotton and corn cultivation is the most likely to result in runoff and erosion. (TAMU)

Sprott, J. Michael, and Lonnie L. Jones

1975 *Economic Impact of Agricultural Production in Texas; Part I, Major Production Regions (TAEX Districts)*. Departmental Technical Report 75-1. The Texas Agricultural Experiment Station, Texas A&M University, College Station. (TAMU)

Data presented rank the value and economic impact of agricultural production in Texas from 1972-1974 and from major production regions. (TAMU)

Stelly, Randall

- 1967 *The Importance of World Trade to Texas Agriculture*. Departmental Information Report 67-5. Department of Agricultural Economics and Sociology, Texas A&M University, College Station.

Stelly points out that, behind Illinois, Texas has the largest stake in world agricultural trade of all U.S. states. (TAMU)

- 1969 *Changes in the Texas Dairy Industry*. Departmental Information Report 69-6. Department of Agricultural Economics and Sociology, Texas Agricultural Experiment Station, Texas A&M University, College Station.

Stelly summarizes major changes that have occurred recently in the number of producers, milk cows, amount of milk production, marketing and cash receipts, and related economic aspects of the industry. At the time of the report, Texas ranked among the twelve leading states in milk production, even though there had been dramatic decreases in the numbers of Texas farms reporting milk for sale and the number of milk cows. Stelly points to the increasing commercialization of milk production and changes in consumption patterns. (TAMU)

Strong, Helen M.

- 1938 A Land Use Record in the Blackland Prairies of Texas. *Annals of the Association of American Geographers*, Vol. 28, No. 2 (June), pp. 128-136.

Strong chronicles the increasingly intensive use of the Blackland Prairies for agriculture and the impact of one-crop farming on the land in the form of erosion and washing. Photographs record the appearance of the land and attempts to retard erosion in the late 1930s. (UT-A)

Texas Agricultural Statistics Service

- n.d. *1866-1889, Texas Historical Crops Statistics*. [Texas Agricultural Statistics Service, n.p.]

The bulletin presents an historic picture of the crops industry in Texas; it appears to be based on a combination of data in yearly county or state tax rolls through 1913 and by federal agricultural censuses. Crops for which statistics are presented are divided into field crops (barley, corn, cotton, cottonseed, cowpeas, guar, hay, oats, peanuts, rice, rye, sorghum, soybeans, sugarbeets, sugarcane, sunflowers, and winter wheat), fruits and nuts (grapefruit, oranges, peaches, pecans), and vegetables (broccoli, cabbage, cantaloupes, carrots, cauliflower, celery, sweet corn, cucumbers, honeydew melons, lettuce, onions, green peppers, potatoes, spinach, sweet potatoes, tomatoes, and watermelons). A map shows the crop producing areas in Texas. One set of graphs depicts the planted number of acres for barley, corn, cotton, hay, oats, peanuts, rice, sorghum, soybeans, wheat, citrus, pecans, carrots, onions and potatoes; another set depicts the volumes of production for the same crops. Depending on the crop, statistics are provided for a variety of date ranges, all of which end in 1989 and some of which begin as early as 1866. (UT-A)

n.d. 1867-1990, *Texas Historic Livestock Statistics*. [Texas Agricultural Statistics Service, n.p.]

This historic picture of the growth and development of the livestock industry in Texas appears to be based on a combination of data in yearly county or state tax rolls through 1913 and by federal agricultural censuses. Livestock for which statistics are presented are cattle and calves, milk cows and dairy products, sheep and wool, goats and mohair, hogs and pigs, poultry (chickens and turkeys), bees and honey, and horses and mules. Data are presented in tabular form; a single graph depicts the number of cattle and calves between January 1, 1867, and 1990. A map shows the crop reporting districts in Texas. A note explains the various definitions of farms that have appeared in federal censuses of agriculture between 1910 and 1990. (UT-A)

Texas Department of Agriculture

1907- *Bulletins*. Von Boeckmann-Jones, Co., Printers, Austin, Texas.

Texas Department of Agriculture *Bulletins* were published bimonthly by the Department beginning in 1907. Some bulletins contain special reports, such as R. T. Milner, *East Texas: Its Topography, Soils, Timber, Agricultural Products, People, Rainfall, Streams, Climate, Etc.* (Von Boeckmann-Jones Co., Printers, Austin, Texas, 1914); R. T. Milner, *Corn Culture* (Von Boeckmann-Jones Co., . Printers, Austin, Texas, 1908); A. K. Short, *Swine Management in Texas* (Von Boeckmann-Jones Co., Printers, Austin, Texas, 1913). (TSLAC)

1974- *Texas Family Land Heritage*. Texas Department of Agriculture, Austin.

An annual listing of properties designated by the Family Land Heritage program is organized by county and then by property name. General information about location is provided and ownership information summarized. Families participating in the program provide family histories, histories of land use, description of improvements, and information about the types of agriculture practiced on the property. Statistics about the number of acres in the original parcel versus those in the current acreage appear in each entry as well as a statement of crops or livestock raised historically and currently. (TSLAC)

Towne, Charles Wayland, and Edward Norris Wentworth

1945 *Shepherd's Empire*. University of Oklahoma Press, Norman.

Wayland's and Wentworth's publication was the first comprehensive scholarly treatment of the history of the sheep industry from its beginning with the Spanish conquest of Mexico to its spread through the mission system into the greater Southwest. The authors discuss sheep raising in California and in Texas and provide details about the impacts of predators, inclement weather, and cattlemen. They also describe the organization of the industry and associated activities, and identify the organization of personnel involved in owning, herding, sheering, and otherwise caring for sheep. Limited information is provided about goats. (UT-A)

Traweek, Stella

[1949] *The Production and Marketing of Mohair in Texas*. Bureau of Business Research, Research Monograph No. 12. The University of Texas, Austin.

Traweek discusses the history of the introduction of Angora goats to Texas and development of the stock. She argues for the importance of the industry; the appropriateness of the natural environment in Texas for goat raising; the raising and sheering of Angora goats; and the storage, transportation, buying, and warehousing of mohair. (UT-A)

United States. Department of Agriculture. Interbureau Coordinating Committee on Post-war Programs
1944 *Agricultural Atlas, Arkansas, Louisiana, Oklahoma, Texas*. S.n., Little Rock, Arkansas.

The atlas provides maps of natural regions, landforms, urban and rural populations, rural-farm populations, types of farming areas and sub-regions, and tables of statistics about agricultural topics. The atlas focuses on the period 1930-1940. (TAMU)

United States. Department of Commerce, Bureau of the Census

1933a *Fifteenth Census of the United States: 1930. Census of Agriculture. Large-Scale Farming in the United States, 1929*. United States Government Printing Office, Washington.

In text, maps, and graphs, the federal census place Texas large-scale agriculture in a national context. Types of farms and industries for which statistics are presented include truck, fruit, cotton, crop-specialty, dairy, stock (ranches), poultry, cash-grain, animal-specialty, and feed lots. (UT-A)

1933b *Fifteenth Census of the United States: 1930. Census of Agriculture. The Negro Farmer in the United States*. United States Government Printing Office, Washington.

In text and maps, the federal census discusses the shift of rural Negroes to the urban industrial centers, and the impacts of the shift on the agricultural status of Negroes and on agriculture as an industry between 1910 and 1930. The author concludes that as farm owners, tenants, and managers, Negroes constituted an appreciable but diminished national asset in the larger agricultural community. (UT-A)

Volanto, Keith J.

1996 Leaving the Land: Tenant and Sharecropper Displacement in Texas during the New Deal. *Social Science History*, Vol. 20, No. 4 (Winter), pp. 533-551.

Volanto analyzes the alleged role of the Agricultural Adjustment Administration in displacement of tenants and sharecroppers during the 1930s in the Blackland Prairie and northeast sandy lands/post oak regions of Texas. (UT-A)

Waggoner, J. E.

1928 *Electricity on Texas Farms: Central Power Station Service*. Texas Engineering Experiment Station Bulletin 35. Texas Engineering Experiment Station, College Station.

Waggoner surveyed 505 Texas farms in response to the interest of farmers and electric power companies in rural electrification. The greatest number of them were farms on the "Black Waxy Prairie," 65 of them in Guadalupe, Caldwell, Hays, Bastrop, Williamson, Milam, Bell, and McLennan counties. He referenced a study by the newly formed Texas State Committee on the Relation of Electricity to Agriculture, which undertook several projects, the first of which was a

study of “the present character of Texas agriculture with the future agricultural trends indicated.” Waggoner’s publication sought to list the uses of electricity on Texas farms, describe the ways in which current uses expected to extend or increase equipment, show the effects of the types of farming on the use of electrical energy, compare the use of electrical power with other types of mechanical power, point out how present users think of electricity on their farms, and identify the need for more research in certain fields. (TAMU)

Whitaker, James H.

1979 *Agricultural Buildings and Structures*. Reston Publishing Company, Reston, Virginia.

Whitaker states that the text is “intended to give a logical approach to the planning and design of structures in keeping with modern agriculture.” The first part of the publication discusses the development of farm buildings in North America, construction materials, and structural design. A second part takes a systems approach and uses it to discuss the selection, layout, and design of buildings associated with specific farm enterprises such as dairies, poultry, general livestock, crop storage, and miscellaneous buildings. (TAMU)

White, Matt

2006 *Prairie Time: A Blackland Portrait*. Texas A&M University Press, College Station.

White’s book focuses on the natural, non-agricultural landscape of the Blackland Prairie. (UT-A)

Wooley, John C.

1941 *Farm Buildings*. McGray-Hill Book Company, Inc., New York.

Wooley presents information helpful to planning agriculture-related buildings with the idea that it will be useful to farm managers and operators and others. He begins with a summary of the development of farm buildings in the United States by periods in building development and then moves to technical information about construction. He then focuses on special-purpose farm buildings. (TAMU)

1953 *Planning Farm Buildings*. McGraw-Hill Book Company, Inc., New York.

This book by a professor of Agricultural Engineering at the University of Missouri responds to “new conditions in the agricultural industry that call for greater stress on functional design in planning farm structures.” Wooley opens with a discussion of new farming practices and equipment and how they affect buildings; he follows with a discussion of the planning process; cost estimating; and planning associated with dairying, beef cattle, hogs, poultry, sheep, grain and forage, and machinery, supplies, and equipment. He writes about planning for field and yard fencing, for the farm home, and for farm utilities. The text is illustrated with drawings of buildings and site features. (TAMU)

Wright, Cynthia

2011 *Historical Changes and Trends in Livestock Numbers Across Ecoregions in Texas*. Texas A&M University, College Station.

Wright focused on four ecoregions (Edwards Plateau, Lampasas Cut Plains, South Texas, and West Texas) and analyzed the impacts of livestock on rangelands. (TAMU)

Available online: <http://hdl.handle.net/1969.1/ETD-TAMU-2011-05-9686>.

Youngblood, B.

1917 *Barns for Work Animals*. Texas Agricultural Experiment Station Bulletin No. 210. Texas Agricultural Experiment Station, Bryan, Texas.

Youngblood lays out a philosophy of cost vs. benefit in barn construction, the purpose of which is housing animals and feed for a year's feeding. He notes that the general principles of barn construction are the same in the North and the South, but that there is a good deal of difference in the actual method of construction due to differences in climate. In the South, the builder must design for an abundance of ventilation throughout most of the year and protection from the north wind in the winter. Youngblood points out topics the builder should take into consideration: strength of structure, permanence of foundations, types of stalls, feed room design, hay carriers and chutes. He provides a variety of barn plans, specifications, elevations, and photographs. (TAMU)

County Histories

The following annotated list of county histories includes the most commonly used texts for the thirteen-county study area. They are available at the Texas State Library and Archives Commission on the open shelves and at the Dolph Briscoe Center for American History where the shelves are closed. The TSLAC collection is arranged by county and includes not only the general histories but also supplemental material in the form of family histories, genealogical society publications, cemetery inventories, printed censuses (including some reconstructed from 1890), and other materials. Four of the entries cover an area greater than a single county.

Barkley, Mary Starr Barkley

1963 *History of Travis County and Austin, 1839-1899*. Texian Press, Waco, Texas.

Barkley's work describes the nineteenth-century history of Travis County and the state's capital. Information about communities appears throughout the text together with numerous references to local landmarks. One chapter lists Travis County schools and briefly describes them. Another includes a discussion of agriculture and cattle drives.

1970 *A History of Central Texas*. Austin Printing Company, Austin, Texas.

Barkley's history provides an overview of Bastrop, Travis, Hays, Williamson, and Burnet counties. The book is organized by county and incorporates histories of the cities, communities, landmarks, and families within the history of each county. There are photographs of local landmarks.

Batte, Lelia McAnally

1956 *History of Milam County, Texas*. Naylor Company, San Antonio, Texas.

Coryell County Genealogical Society, compiler

1986 *Coryell County Families*. Eakin Press, Austin, Texas.

This history of Coryell County is organized by topics, including first surveys and taxpayers, their occupations and places of origin, schools, the poor farm, rural water systems, agriculture, cemeteries, towns and communities, and family histories.

Etlinger, Josephine Blume Seeliger

1987 *Sweetest You Can Find: Life in Eastern Guadalupe County, Texas, 1851-1951, As Seen in the History of Selected Schools and Communities*. Watercress Press, San Antonio, Texas.

Focusing on school-based communities, Etlinger provides information about mills, country life, and education.

Genealogical and Historical Society of Caldwell County, compiler

2000 *Caldwell County Kin: The First 150 Years*. Hennington Publishing Company, Wolfe City, Texas.

The publication provides a history of Caldwell County, its communities, towns, and cities, and family stories and histories. A map identifies communities.

- 2003 *Historic Caldwell County, Where Roots Intertwine*. Hennington Publishing Company, Wolfe City, Texas.

The companion volume to the 2000 publication discusses nineteen communities in Caldwell County, specific historical events, and famous residents, including notable agriculturalist A. D. Mebane.

Haas, Oscar

- 1968 *History of New Braunfels and Comal County, Texas, 1844-1946*. Hart Graphics & Office Centers, Inc., Austin, Texas.

Haas's book discusses the history of the county and county seat from the prehistoric period through 1846. He provides information about the founders of the county and town, transportation and travel, public buildings, clubs, schools, post offices, industries, and the Civil War. He also provides data, in alphabetical order, from the 1850 and 1860 censuses.

Hill County Heritage Book Committee, The

- 2006 *The Heritage of Hill County, Texas*. Heritage Publishing Consultants, Inc., Clanton, Alabama.

General Hill County history is presented, together with specifics about communities and towns, schools, churches, cemeteries, transportation, historic homes, farms and ranches, the military (including forts), clubs and organizations, businesses, and family histories.

Hill County Historical Commission

- 1980 *A History of Hill County, Texas, 1853-1980*. Texian Press, Waco, Texas.

This publication begins with general contextual history and presents information about archeology in the county, communities, and biographies.

Kelley, Dayton, editor

- 1972 *The Handbook of Waco and McLennan County, Texas*. Texian Press, Waco, Texas.

Kelley's publication, using a *Handbook of Texas* format, provides a similar level of information about an equivalent range of topics.

Lewis Publishing Company, The

- 1893 *A Memorial and Biographical History of McLennan, Falls, Bell and Coryell Counties, Texas*.

This earliest history of a four-county area is considered to be a basic text for the history of the region. It contains an overview history and biographical information about pioneers and prominent citizens, many of whom were leaders in the field of agriculture.

Kesselus, Ken

2005 *History of Bastrop County, Texas: Before Statehood, and History of Bastrop County, Texas: 1846-1865*. Wash Jones Press, Bastrop, Texas.

This is the only comprehensive history of Bastrop County through the Civil War period. Kesselus provides detailed information about the county history beginning with Spanish exploration and continuing through the period of Austin's Little Colony, settlement on the Colorado River and the county's creeks, nineteenth-century industry and agriculture, transportation infrastructure, slavery, and the Civil War.

Limmer, E. A., Jr., editor and compiler

1988 *Story of Bell County, Texas, Volumes I and II*. Eakin Press, Austin, Texas.

Limmer's two-volume study of pre-statehood history, Anglo settlement within the Robertson Colony, Indian relations, early pioneers and battles, creation of the county, county government, early settlements, importance of agriculture, the county during the Civil War, cattle industry, development of railroad systems, and county historical markers. The authors provide histories of seventeen communities, numerous ghost towns, gins in east Bell County, and information about Czech settlement. Volume II provides detailed family histories.

McLean, Malcolm, compiler and editor

1986- *Papers Concerning Robertson's Colony*. The University of Texas at Arlington, Arlington, Texas.

McLean's exhaustive publication of historic documents chronicles the history of the greatest part of the study area. The volumes are valuable sources of biographical information about nineteenth-century settlers and provide an excellent historic context for understanding the agricultural, economic, and social development of much of Central Texas.

Milam County Heritage Preservation Society, compiler and editor

1984 *Matchless Milam: History of Milam County Texas*. Milam County Heritage Preservation Society, n.p.

This history of Milam County is organized by a brief overview of the natural history of Milam County, followed by a social, political, and economic history; photographs of architectural landmarks; and listings of cemeteries, churches, communities, organizations, and schools. The greatest part of the volume presents family history information in alphabetical order by last name; an index provides additional guidance.

St. Romain, Lillian Schiller

1951 *Western Falls County, Texas*. Texas State Historical Association, Austin.

St. Romain recounts the history of migration and settlement in the western part of Falls County between 1835 and 1950. She describes the establishment of plantations before the Civil War and changes in settlement patterns that were galvanized by construction of the San Antonio and Aransas Pass Railroad. Further changes occurred with construction of main highways and farm to market roads. The history includes details about specific plantations, ranches, and farms, including descriptions of buildings.

Scarborough, Clara Stearns

1973 *Land of Good Water, Takachue Pouetsu: A Williamson County, Texas, History*. Williamson County Sun Publishers, Georgetown, Texas.

Scarborough provides information about county prehistory, Spanish and French exploration, Anglo-American settlers and Indian relations, formation of the county, pre- and post-Civil War life, ethnic groups, agriculture, schools, commerce, and railroad construction and other forms of transportation.

Scott, Zelma

1965 *A History of Coryell County, Texas*. Texas State Historical Association, Austin.

The physical setting of the county is described and followed by the area's early military history, county organization, and general history from 1854 to 1963.

Shroyer, Jean, and Hazel Hood, compilers and editors

1985 *Williamson County, Texas: Its History and Its People*. Nortex Press, Austin, Texas.

This volume supplements Scarborough's county-wide history by providing information about the cattle industry and county politics and religion. The publication provides detailed biographical information about residents of Williamson County and replicates the 1860 county federal census and mortality schedule.

Simmons, Frank E.

1936 *History of Coryell County*. Coryell County News, [Gatesville, Texas].

Simmons's brief and anecdotal history of Coryell County includes a discussion of Wendish, German, and Norwegian settlement and landmarks in the county.

Stovall, Frances, Maxine Storm, Louise Simon, Gene Johnson, Dorothy Schwartz, Dorothy Wimberley Kerbow, and Cindy McCoy

1986 *Clear Springs and Limestone Ledges, A History of San Marcos and Hays County For the Texas Sesquicentennial*. Nortex Press, Austin.

The history focuses on development of San Marcos, but also includes contextual information about area-wide settlement, outlying communities, roads, schools, and specific farms.

Tyler, George W.

1936 *The History of Bell County*. Edited by Charles W. Ramsdell. Dayton Kelley, Belton, Texas.

Tyler's early history of Bell County provides reliable background concerning Robertson's Colony, settlements, Indian relations, county organization and records, growth before and after the Civil War, the impacts of Reconstruction, cattle drives through the county, spread of farms (including barbed wire, windmills, and the Grange), results of railroad construction and the Good Roads Movement, the work of the agricultural experiment station, educational institutions, and the impact of World War I on material conditions in the county.

Weinert, Willie Mae

1951 *An Authentic History of Guadalupe County*. The Seguin Enterprise, Seguin, Texas.

Weinert identifies and writes the history of numerous Guadalupe County landmarks, including roads, gins and mills, historic buildings, and communities. She discusses trends in crop production and livestock, as well as the history of cattle drives and cattle trails.

Cultural Resource Management Context Studies, National Register Nominations

aci consulting [Freeman, Martha Doty]

2006 *Historic Resources Survey Report: FM 969 from FM 3177 (Decker Lane) to SH 130, Travis County.* Austin, Texas.

The report provides a historic context and associated property types discussion for the north Travis County project area. The historic context provides a discussion of corn, grain, and livestock production as well as sheep and cattle-raising. The property type discussion, which is arranged by use, provides a list of character-defining features and good representative photos. Overall the information provided by this report will help in understanding the broad patterns of settlement and land use in the project area.

Blake, Marie E. and Terri Myers

1999 *After Slavery: The Rubin Hancock Farmstead, 1880-1916, Travis County, Texas.* Reports of Investigations, Number 124. Prewitt and Associates, Inc., Austin, Texas.

The history of an African American farming family in north-central Travis County is presented in this report. The chronological history based on primary and secondary resources is very family and site specific, but the report does attempt to place it into a larger context of rural African American agricultural practices in Central Texas. Historians have accomplished this by comparing the Rubin Hancock farmstead to the adjacent Anglo American farming community and several other African American farming communities in Central Texas. Given that this is simply a historic context, there is no in-depth discussion of property types but typical buildings and structures found on African American farmsteads are discussed. Despite the narrow focus of this report, it provides useful insight into African American settlement and land use in Central Texas.

Dase, Amy E., Summer Chandler, Stephanie Katauskas, and Celine Finney

2010 *Historic Farms and Ranches of Bexar County, Texas.* National Register of Historic Places Multiple Property Listing.

The report provides an overall agricultural history of Bexar County, as well as associated property types related to agriculture. The historic context is divided into two themes: agriculture in Bexar County, 1800-1970, and ethnicity in rural Bexar County, 1800-1970. As a result, the report provides a thorough analysis of important economic, transportation, technological advances, and ethnic trends that shaped the course of agriculture in the county. In addition, the report includes a comprehensive property type section that ties ethnic traditions and associated building styles with each resource type. The property type section, however, fails to address how individual resource types fit within a cultural landscape approach. Though the report includes a section covering registration requirements for agricultural properties, the topic was not complete in the version of the report reviewed. Overall, the report provides a detailed historic context for Bexar County agriculture and ethnic influences as well as an agricultural property types section that incorporates regional influences.

Freeman, Martha Doty

- 1994 *Agriculture in Texas: Ranching and Stock Farming on the Eastern Edwards Plateau, 1845-1941*. Komatsu/Rangel, Inc., Fort Worth, Texas.

The historic agricultural practices at present-day Camp Bullis in Bexar County are presented in the report's historic context. A larger multi-county, west-central Texas region historic context is also provided in the report. The chronological historic context discusses settlement patterns, the various agricultural practices, and ethnic groups within the region that helped define its historic resources. In addition, the report includes a chapter on property types discussing significance and requirements for NRHP-eligibility. Overall, the report provides a comprehensive history of ranching and stock farming in west-central Texas and offers valuable information regarding German immigrants.

Freeman, Martha Doty

- 1997 *A History of Guadalupe River State Park and Honey Creek State Natural Area, Comal and Kendall Counties, Texas*. Martha Doty Freeman, Austin, Texas.

The report on an area on both sides of the Guadalupe River in Kendall County and the Hill Country portion of Comal County provides natural and cultural contexts for a history of the development of the area between the mid nineteenth century and late twentieth century. The author describes the region as one that illustrates the traditional German *Altlandschaft*, or cultural imprint of German culture through its historic properties. Other properties, dating largely from the twentieth century, illustrate gradual changes in taste that occurred as an otherwise traditional population became increasingly acculturated, and non-German occupants established their own homes in the area.

Freeman, Martha Doty, Amy E. Dase and Marie E. Blake

- 2001 *Agriculture and Rural Development on Fort Hood Lands, 1849-1942: National Register Assessments of 710 Historic Archeological Properties*. Archeological Resource Management Series Research Report No. 42. Prewitt and Associates, Inc., Austin, Texas.

The report addresses historic agricultural resources within Fort Hood lands taken during the 1940s acquisition. The report includes two historic contexts, the most useful of which addresses the development of agriculture in Bell and Coryell counties from 1849 to 1942. In addition, the study incorporates a detailed property type typology discussion for agricultural resources. Finally, the report provides an excellent section on significance statements and registration requirements for agricultural properties on Fort Hood lands that will prove very useful in creating NRHP methodologies for Central Texas.

Freeman, Martha Doty, Sherry N. DeFreece Emery and Deborah Dobson-Brown

- 2007 *Historic Context: Elijah Sterling Clack Robertson Plantation and Ranch, Salado, Bell County, Texas*. Report of Investigations Number 59, Lopez Garcia Group, Dallas, Texas.

The report presents a history and NRHP evaluation of the Robertson Plantation and Ranch in Bell County. The chronological historic context examines the evolution of and impacts to the property, giving focus to transportation, family and slave life, and the neighboring community of

Salado. An analysis of comparable properties in Texas places the property into a larger statewide context and helps assess its significance and NRHP eligibility. The report also makes good use of historic maps, photographs, and GIS, and provides a useful collection of current photographs of the property. The detailed information regarding plantation and ranch life in Central Texas presented in the report makes it a valuable resource.

Freeman, Martha Doty, Donald R. Abbe, Amy Dase, Sherry N. DeFreece Emery, Marie Morton, and Steve Gaither

2005 *Texas Agriculture Context Research Design*. Lopez Garcia Group, Dallas, Texas.

The research design includes a very useful statewide inventory of agricultural research sources and repositories. In addition, the report provides a logical and well-thought out process for dividing the state into agricultural regions for context development.

Hardy, Daniel and David Moore

1989-90 *Historic Resources Survey of Ellis County, Texas: An Inventory for the U.S. Department of Energy*. Hardy, Heck, Moore, Inc., Austin, Texas.

The results of a historic resources survey conducted in Ellis County are presented in the report. The historic context provides an overview of cotton growing in the county and outlines the impacts transportation, industry, and manufacturing had on cotton farming. The property types discussion is comprehensive and arranged by use. Even though Ellis County falls outside of the project area, agricultural trends highlighted in the report might be found within the proposed Central Texas region. The report is also useful for its graphics: vernacular floor plans, resource photographs, and historic maps.

Hardy, Heck, Moore, Inc.

2007 *Historic Ranch Study and Preliminary NRHP-Eligibility Assessments within the New-Location Corridor for the Proposed I-69/TTC in South Texas*. Hardy, Heck, Moore, Inc., Austin, Texas.

The report provides preliminary NRHP-eligibility assessments for historic ranching complexes in Jim Wells, Duval, Brooks, and Hidalgo counties that potentially could be impacted by the construction of the proposed I-69/TTC corridor. To provide the background for assessment of historic significance, the report provides a chronological historic context that links settlement patterns and agricultural land use to environmental features such as access to water, soils, and climate. The report additionally provides an in-depth discussion of property types, setting forth types of farms and ranches in the area by time period. For each farm or ranch type, the report lists characteristic individual resources and associated themes from the historic context. Although the study area of the report does not overlap with the Central Texas area proposed for the current agricultural study, the logical organization and linking of the historic context, property types, and eligibility determinations provide a useful prototype.

Hardy, Heck, Moore, Inc.

- 2007 *Intensive-Level Historic Resources Survey Report, FM 1957: SL 1604 to FM 471 San Antonio, Texas, Bexar and Medina Counties*. Hardy, Heck, Moore, Inc., Austin, Texas.

The report provides an overall historic context of farming in northern Bexar and Medina counties, giving focus to the history and historic-age properties associated with the Louis F. Wurzbach family, German immigrants from Mannheim. The context also discusses settlement and land use patterns and the impact of transportation networks on the region's agricultural practices. Included in the report is a discussion of property types, arranged by a combination of use and form. In the report's discussion of NRHP eligibility, three areas of significance are highlighted: 1842-1880: Initial Settlement and Colonization by European Immigrants; 1881-1911: The Railroad and the Foundations of Change; and 1912-1957: Modernization and Assimilation. Overall this report is highly relevant to our study and will provide useful information regarding settlement and agricultural practices in Bexar and Medina counties.

Hicks & Company

- 2010 *Historic Resource Survey of Northeast Travis County, Texas*. Hicks & Company, Austin, Texas.

Hicks & Company surveyed northeastern Travis County, photographing and mapping historic age resources and identifying resources eligible for listing in the NRHP. They also developed a historic context for the area and assessed the project area for eligible historic districts and rural historic landscapes. They argued for the possible eligibility of smaller agricultural landscapes within the larger survey area.

Hindes, Kay

- 1996 *Historic Resources Survey of Rural Agricultural Properties in County Commissioner's Precinct 2 of Hays County, Texas*. Kay Hindes, Charlotte, Texas.

Hindes completed a county-wide, comprehensive survey of rural historic resources in Hays County. She recorded 123 pre-1945 sites in the area of the Balcones Escarpment and on the Blackland Prairie. Properties were assessed for NRHP eligibility as individual properties and as parts of historic districts within rural historic landscapes. She developed three historic contexts: Cowboys, Campsites, and Corrals: The Ranching Industry in Western Hays County 1850-1945; Tied To The Land: Farming on The Southern Blackland Prairie Hays County, Texas 1850-1945; and Rural Agriculture in Hays County: The Dairy Industry. Finally, she proposed two historic districts: "Onion Creek Settlement Historic District" and "Niederwald and Uhland Rural Historic District."

Moore, David, and Terri Myers

- 1996 *Westphalia Rural Historic District*. National Register of Historic Places nomination. Available on the Historic Sites Atlas through the Texas Historical Commission, Austin.

The NRHP nomination for the Westphalia Rural Historic District in Falls County provides a useful historic context for German settlement in Central Texas, as well as a discussion of typical farm site plans and cultural landscape features. The historic context is structured chronologically, with a significant discussion of German-Texas settlement patterns and land use. Multiple oral histories were obtained to complete the historic context. The nomination also includes a

discussion of farmsteads as a property type. However, although it discusses site plans, buildings, and cultural landscape features, it does not describe the character-defining features of each property type or resource type. Although the nomination does not discuss the integrity of farmsteads broadly, it does offer a case study of an active farm on which alterations were made as necessary to continue farming. A comprehensive bibliography accompanies the nomination. Overall, the nomination is valuable for its information about German settlement, the history of Falls County, and typical land use and site development patterns of farmsteads.

Myers, Terri, Diane Williams and Sara Kirtland

1996 *Historic Context for Southeast Travis County and Cultural Resources Survey and Assessment for the New Austin Airport*. Hardy, Heck, Moore, Inc., Austin, Texas.

This report provides a historic context, property type discussion and NRHP-eligibility determinations for resources affected by the construction of the airport in southeast Travis County. The historic context is presented chronologically and highlights patterns found in the agricultural-based economy of southeast Travis County with emphasis on the impacts of immigration. This context provides the framework for evaluating significance in both a broad property type discussion and for the individual historic resources located within the project area. Overall, the report provides a detailed historic context and a comprehensive inventory and discussion of property types for southeast Travis County.

Moir, Randall W. and David H. Journey

1987 *Pioneer Settlers, Tenant Farmers, and Communities: Objectives, Historical Background, and Excavations, Richland Creek Technical Series, Volume IV*. Archaeology Research Program, Southern Methodist University, Dallas, Texas.

The fourth volume in the five-volume archeological series presents a useful historic context for tenant farming in Navarro and Freestone counties. The historic context is presented chronologically and focuses on the rise and decline of cotton growing among tenant farmers with emphasis given to patterns of settlement and the impact of transportation networks. Additionally, the typical life of tenant farmers is presented through assessments of thirty-eight properties investigated by archeologists. While typical farmstead layouts are described, a comprehensive architectural discussion of property types is left out of this report; it is included in Volume V of this series. Despite the study's focus on north central Texas, the comprehensive nature and presentation of research provides useful information for the Central Texas study area proposed for the current agricultural study.

Myers, Terri and A. Elizabeth Butman

2006 *Rural Historic Landscape Analysis: Quihi Vicinity, Medina County, Texas*. Preservation Central, Austin, Texas.

The results of an intensive-level survey of cultural resources near Quihi in Medina County are presented in the report. A historic context of the area covering the period from 1718 to 1980 provides the framework for the report's comprehensive discussion of property types. Patterns of settlement, typical farmstead layout, and resource types are all reviewed. The report also discusses rural historic landscapes and districts in its discussion of NRHP eligibility. Overall the report is an informative resource for its in-depth discussion of property types and for the

information it provides regarding German and French farmers and their settlement and use of the land.

Sitton, Thad

2006 *Sandyland Farmers: Life in the Countryside Before Camp Swift, 1920-1942*. Archaeological Studies Report No. 9. Center for Archaeological Studies, Texas State University-San Marcos.

Sitton describes the history of subsistence farming in sandy loam soils that characterized a portion of Bastrop County for almost a century. He tracks the slow evolution of the agricultural economy from one based on cotton cultivation to a subsistence model based on garden truck and limited numbers of livestock, noting that the pattern in Bastrop County's sandyland was typical of much of the South. He also notes that the "subsistence South" has been little studied by historians, who are overly preoccupied with studies of cotton agriculture. The publication includes numerous photographs of families and farms, as well as a drawing of a subsistence farm layout.

Soil Surveys

Soil surveys for the thirteen-county study area include historical information about the history of settlement, agriculture, agricultural methods and conditions, climate, and irrigation (where present); they correlate soil types with agricultural production. Digital versions of the surveys and accompanying maps are available online at: <http://texashistory.unt.edu/browse/collection/TXSS>.

Batte, Charles D.

1984 *Soil Survey of Comal and Hays Counties, Texas*. The Service, [Washington, D.C.]

Beck, M. W.

1936 *Soil Survey of Falls County, Texas*. U.S. Government Printing Office, Washington, D.C.

Carter, William T.

1918 *Soil Survey of Bell County, Texas*. Government Printing Office, Washington, D.C.

Carter, William T., M. W. Beck, E. H. Templin, and H. W. Hawker

1930 *Soil Survey of Milam County, Texas*. U.S. Government Printing Office, Washington, D.C.

Kocher, A. W., and Party

1912 *Reconnaissance Soil Survey of Southwest Texas* [including Bexar County]. Government Printing Office, Washington, D.C.

1915 *Reconnaissance [sic] Soil Survey of South-Central Texas* [including all or parts of Comal, Hays, and Travis counties]. Government Printing Office, Washington, D.C.

Lowther, A. C., and Leroy E. Werchan

1978 *Soil Survey of Caldwell County, Texas*. The Service, [Washington, D.C.].

McCaleb, Nathan L.

1985 *Soil Survey of Coryell County, Texas*. The Service, [Washington, D.C.].

Mangum, A. W., and H. L. Belden

1905 *Soil Survey of the Austin Area, Texas*. Government Printing Office, Washington, D.C.

1906 *Soil Survey of the San Marcos Area, Texas*. Government Printing Office, Washington, D.C.

Mangum, A. W., and M. Earl Carr

1906 *Soil Survey of the Waco Area, Texas*. Government Printing Office, Washington, D.C.

Ramsey, Robert N.

1977 *Soil Survey of Guadalupe County, Texas*. The Service, [Washington, D.C.].

Templin, E. H.

1938 *Soil Survey, Williamson County, Texas*. U.S. Government Printing Office, Washington, D.C.

Agricultural Theme Study for Central Texas
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1958 *Soil Survey, McLennan County, Texas*. U.S. Government Printing Office, Washington, D.C.

United States. Department of Agriculture. Bureau of Soils

1904a *Soil Map, Texas, Austin Sheet*. Government Printing Office, Washington, D.C.

1904b *Soil Map, Texas, San Antonio Sheet*. Government Printing Office, Washington, D.C.

1906a *Soil Map, Texas, San Marcos Sheet*. Government Printing Office, Washington, D.C.

1906b *Soil Map, Texas, Waco Sheet*. Government Printing Office, Washington, D.C.

1908 *Soil Map, Texas, Bastrop County Sheet*. Government Printing Office, Washington, D.C.

1912 *Soil Map, Reconnaissance Survey, Southwest Texas Sheet*. Government Printing Office, Washington, D.C.

1915 *Soil Map, Reconnaissance [sic] Survey, South Central Texas Sheet*. Government Printing Office, Washington, D.C.

1918 *Soil Map, Texas, Bell County Sheet*. Government Printing Office, Washington, D.C.

United States. Bureau of Chemistry and Soils

1930 *Soil Map, Milam County, Texas*. Government Printing Office, Washington, D.C.

1936 *Soil Map, Falls County, Texas*. Government Printing Office, Washington, D.C.

1938 *Soil Map, Williamson County, Texas*. Government Printing Office, Washington, D.C.

Werchan, Leroy E.

1974 *Soil Survey of Travis County, Texas*. U.S. Government Printing Office, Washington, D.C.

Winston, R. A.

1908 *Soil Survey of Bastrop County, Texas*. U.S. Government Printing Office, Washington, D.C.

Theses and Dissertations

Adkins, William Gray

- 1963 Projected Changes to 1970 in Characteristics and Numbers of Farms in the Texas Blackland Prairie: An Application of Empirical Estimating Procedures. PhD dissertation, Texas A&M University, College Station.

Atkinson, Bertha

- 1929 The History of Bell County, Texas. MA thesis, The University of Texas at Austin.

Atkinson introduces the history of Bell County with a description of its topography and geography and then organizes the thesis chronologically: pre-organization period (1825-1850), pre-war period (1850-1860), Civil War and Reconstruction (1860-1880), and economic and social development (1880-1929). She traces the history of agriculture from the earliest period, when settlers engaged almost exclusively in stock raising, through the Civil War, and into the 1870s, when the county's population increased significantly, barbed wire fencing was introduced, and farmers began to cultivate the Blackland Prairie, primarily growing corn, cotton, wheat, and oats. Construction of rail lines intensified settlement and farming, with an emphasis on cotton cultivation. Fencing of the open range encouraged the introduction of blooded stock with the result that the numbers of cattle decreased in the early twentieth century, but the quality of grades increased. In the 1920s, poultry raising and dairying increased in frequency.

Blair, William Stuart, Jr.

- 1954 A Study of Typical Farm Service Buildings to Determine Panel Sizes and Loadings in Current Use. MA thesis, Agricultural and Mechanical College of Texas.

Blair focuses on three major types of farm buildings: poultry houses, dairy barns, and implement sheds. The purpose of his thesis is to establish modules for wall panels and determine loads (wind, snow, and weight of materials) the panels are expected to carry.

Blaisdell, Robert Stephen

- 2001 *Indicators of Soil Quality Change in the Blackland Prairie of Texas During Restoration*. PhD dissertation, Texas A&M University.

Blount, John Franklin

- 1929 The Analysis of the Operation of the Texas Cotton Growers' Finance Corporation, 1926-1927. MA thesis, Texas A&M University, College Station.

Brown, Theodore Max

- 1987 The Cultural Ecology of Agriculture in Caldwell County, Texas. 2 volumes. PhD dissertation, The University of Texas at Austin.

Brown's work is a cultural geography-based study of agriculture during the historical period in Central Texas with an emphasis on 1840-1987. He discusses the periods of what he calls pastoral capitalism (1865-1880), field-crop capitalism (1875-1946), and diversified family farms (1946-

1987). The largest part of the study is based on analytical interviews with fifteen agriculturalists in Caldwell County.

Cook, Foy Oscar

1935 An Economic Study of Regional Trends of Tenant Farming in Texas. MA thesis, Agricultural and Mechanical College of Texas.

Cook bases his study on statistics in the federal census between 1880 and 1930. It describes the growth of tenancy in Texas, the trend of crops and tenants and the relationship between the two, percentage of tenancy by type of farm, and the value of land and improvements operated by a variety of users. Information appears in text, maps, graphs, and tables and depicts the distribution of cotton, wheat, and rice, and of tenant populations over time.

Dobie, Dudley Richard

1932 The History of Hays County, Texas. MA thesis, The University of Texas at Austin.

Dobie describes the topography and geography of Hays County and then follows a chronological organization (early history to 1861; Civil War and Reconstruction, 1860-1880; and period of development, 1880-1932). He discusses the growth following railroad construction and the bifurcated agricultural economy: crop raising in the eastern part of the county and sheep, goat, and cattle raising in the western part.

Evans, Samuel Lee

1955 Texas Agriculture, 1865-1880. MA thesis, The University of Texas at Austin.

Evans traces the expansion of Texas agriculture after the Civil War for two purposes: to determine methods and tools used and to ascertain the extent to which livestock raising occurred at the same time and in the same places as the cultivation of crops. He bases his analyses of crop and animal distributions on Elmer Johnson's *The Natural Regions of Texas*, with slight accommodations for county lines. The thesis is organized into discussions of the geographical distribution of fourteen different crops, general farming practices (including land clearing, crop rotation, use of fertilizer, plowing, fencing, and hedge construction), details of cotton culture (row planting, equipment used, cultivation, pest control, harvesting, gins, presses, and bales), details of grain culture (land preparation, planting, pest treatment, harvesting, machinery and equipment, binding and shocking, threshing, milling, and transportation and sale), and use and raising of farm animals, including oxen, mules, horses, cattle, milk cows, swine, and sheep.

1960 Texas Agriculture, 1880-1930. PhD dissertation, The University of Texas at Austin.

In a follow up to his 1955 thesis, Evans traces the development of Texas agriculture, focusing on crops and livestock, agricultural unions, tenants and sharecroppers, and commodity marketing associations during the period 1880-1930. He relies heavily on federal decennial censuses from 1879 to 1929 and remarks that "census data occasionally are grossly defective for certain counties or areas." Perhaps the greatest value of the study as an overview of Texas agriculture during the late nineteenth century and first third of the twentieth is the information Evans presents about the sequential appearance of specific crops and animals in different parts of the

state and the details of agricultural practice, such as those related to land clearing and then reversion as crop yields declined.

Foley, Neil Francis

- 1990 The New South in the Southwest: Anglos, Blacks, and Mexicans in Central Texas, 1880-1930. PhD dissertation, The University of Michigan.

Foley's dissertation discusses the transformation of Central Texas after the Civil War, describing it as a change from cattle range to cotton patch as population grew explosively. He traces the history of cotton production in the Black Prairie and links the increasing number of farms to the decreasing sizes of each. He discusses the rise of tenancy with both Black and Mexican populations and the increasing movement of Mexicans into the Central Texas area where they were recruited to serve in the cotton fields.

Freeman, Billy Gervice

- 1963 An Economic Analysis of Farm Adjustment Opportunities on the Rolling Blackland Soils of the Central Texas Blackland. MA thesis, Texas A&M University.

Harper, Cecil, Jr.

- 1988 Farming Someone Else's Land: Farm Tenancy in the Texas Brazos River Valley, 1850-1880. PhD. dissertation, University of North Texas.

Using federal censuses and county tax rolls, Harper studied landless farmers in three Brazos River valley counties—Fort Bend, Milam, and Palo Pinto. He concludes that landless farmers were a relatively insignificant factor in the pre-Civil War agricultural economy. After the war, poor tenant farmers were found in the central part of the river valley. But the reactions of Black and White landless farmers were so different that Harper suggests there were two systems of tenant farming.

Henderson, Katherine Bradford

- 1924 The Early History of Milam County. MA thesis, The University of Texas at Austin.

Henderson's thesis focuses on the history of the county prior to the Civil War.

Knott, Laura Lynne

- 2004 The Historic Rock Fences of Blanco County: Their Past, Their Future. MA thesis, The University of Texas at Austin.

Knott's study of rock fences in Blanco County concludes that, while Germans built many of them, their techniques were influenced by their Anglo-American neighbors whose own fence-building tradition was British-based. She describes the fences as important components in a historic rural landscape that contribute to the narrative of local places.

Lengert, Margaret Eleanor

- 1949 The History of Milam County. MA thesis, The University of Texas at Austin.

Lewis, James Ricky

- 1987 Texas Cotton Gin House Architecture: A Survey and Case Study of the Cotton Gin as a Historic Building Type. MA thesis, The University of Texas at Austin.

Lewis introduces his study with a brief history of cotton production and nineteenth- and twentieth-century Texas cotton ginning technology and the architecture associated with it. He presents the results of a sample survey of historic cotton ginning facilities (including gins, seed houses, and weigh houses) in Anderson, Austin, Bell, Caldwell, Calhoun, DeWitt, Falls, Kenedy, Lavaca, Leon, Mitchell, Navarro, Reeves, Robertson, Victoria, Washington, and Williamson counties. He focuses on an analysis of the Belton Farmers Co-op Gin, Inc., in Bell County and the Klepac and Sons Gin Company in Theon, Williamson County. Figures in the text depict railroad lines, gins (including diagrammatic floor plans), boll weevil dispersion, cotton production by county, and operating gins by county in 1975.

McHaney, John Grover

- 1953 Significant Economic Changes in Texas Agriculture from 1930 to 1950. MA thesis, Texas A&M University.

Moellering, Arwerd Max

- 1938 A History of Guadalupe County, Texas. MA thesis, The University of Texas at Austin.

Moellering provides a physiographic, climatic, and natural resources background before providing a chronological history of the exploration and settlement of Guadalupe County. The thesis includes photographs of rural architectural landmarks, many associated with agricultural properties. He discusses crops, stock raising, and slavery as well as ethnic settlement, and then focuses on agricultural development between 1876 and 1938.

O'Banion, Maurine Mattie

- 1931 The History of Caldwell County. MA thesis, The University of Texas at Austin.

O'Banion provides a history of Caldwell County through 1930 organized chronologically. Numerous historic photographs depict fencing, log cabins and frame homes, a molasses mill, and various other landmarks. She identifies the period 1870-1885 as the cattle era, which decreased in importance following railroad construction and the availability of wire fencing; and the period 1880-1920 as the farming era, which was dominated by cotton and corn cultivation.

Patzewitsch, Wendy Winborn

- 2009 Changing Patterns and Perceptions of Water Use in East Central Texas Since the Time of Anglo Settlement. PhD dissertation, Texas A&M University, College Station.

Patzewitsch identifies four regimes of patterns and perceptions associated with water use and their impact on the historical landscape: the agrarian regime, waterworks regime, dam and levee regime, and groundwater regime.

Available electronically: <http://hdl.handle.net/1969.1/ETD-TAMU-1317>.

Randle, Charles F.

- 1950 A Study of the Farm Management Practices of Fifty Negro Farmers in McLennan County, Texas. MA thesis, Prairie View Agricultural and Mechanical College.

Randle studies the extent to which Negro farmers in McLennan County employed accepted farm management practices and the extent to which those practices affected economic status. He collected and presented data about how farmers allocated resources, selected farm machinery, used and supervised labor on the farm, sold products, and kept records. He questioned why farms operated by members of the same race and of similar sizes had different appearances and levels of productivity.

Reese, James V.

- 1961 A History of Hill County to 1873. MA thesis, The University of Texas at Austin.

Reese describes the natural setting of Hill County and then discusses the history of the county through the early 1870s. There is little description of agriculture, with the exception of the observation that the greatest change in the economy came in the form of a switch from pre-Civil War subsistence agriculture to post-Civil War production of money crops such as cotton and corn. Cattle raising became secondary in importance.

Steinberg, Susan L.

- 1984 *Vegetable Production Systems of Farmers in East and Central Texas Using the Dallas Farmers Market*. MA thesis, Texas A&M University, College Station.

White, Raymond Elliott

- 1957 The History of the Texas Cotton Ginning Industry, 1822-1957. MA thesis, The University of Texas at Austin.

This overview history of the Texas cotton ginning industry, the manufacture of gins, and cooperative ginning documents the growth, development, and importance of the industry. It begins with the origin and development of ginning on plantations and the transition of the local activity to commercial ginning after the Civil War. White also discussed the development of equipment manufacture from scattered shops and local markets to large Texas companies manufacturing equipment for local, state, national, and even international distribution; he provides histories of each. He discusses the extent to which the growth and spread of cotton culture was dependent on the invention of equipment that speeded the processing of cotton. The thesis includes cut-away illustrations of nineteenth- and twentieth-century gins. Finally, he discusses the origins and organization of various gin associations.

Wimberley, Laura Anne

- 2001 The "Sole Source": A History of San Antonio, South Central Texas, and the Edwards Aquifer, 1890s-1990s. PhD dissertation, Texas A&M University, College Station.

APPENDIX C: HOW TO USE LEGAL RECORDS

The Process:

1. Locate the subject property on a USGS quadrangle.
2. Get the legal description of the property and owner's name from the appraisal district. Legal descriptions may include metes and bounds, the name of the original grant, a survey or abstract number, and if in an urban setting, a subdivision name, block, and lot. Appraisal district records may include notations that show when the current and previous owners acquired the property and identify the records where the acquisitions appear.
3. Get a plat of the property from the appraisal district. If the property is in a rural setting, be sure that the plat extends to the limits of a grant.
4. Overlay the property and grant boundaries on the USGS quadrangle.
5. Go to the county clerk's office.
6. Locate the direct and indirect indexes. These are organized by last name, older indexes are organized by decades; more recent ones may cover only a few years.
7. Locate most recent indirect index that has the current owner's name.
8. Look at the key in the front of the index volume or at the top of each page.
9. Locate pages in the index that might include your property owner.
10. Begin to scan the index. If you find the name you are looking for, look at the entry. You will see a date the document was signed, a date it was filed with the county clerk, a description of the kind of document you will be looking at, a description of the property (depending on the age of the document and practices of the county), and a reference to a volume and page number.
11. Pull the indicated volume(s) and read the document(s).

12. Be sure the property description provided in the document matches that of the property you are researching.
13. Take the name of the grantor as it appears in the deed and look for his or her name in the grantee index.
14. Be exhaustive and systematic. Keep records of which deeds you have looked at, especially if the index does not include a legal description.
15. Notice if the deed includes references to earlier deeds.
16. You seem to hit a dead end. What do you do?
 - a. Don't panic; there is logic to it all. You may have overlooked something, so recheck. Sometimes descriptions in the indexes are incorrect, misleading, or incomplete.
 - b. Check and see if the grantee received the property through a will or partition action rather than through a sale, which would be recorded in the deeds.
 - c. Look at assessor's abstracts. In some counties, the researcher can compile a transferal record from approximately 1880 to the present using assessor's abstracts alone.
 - d. You may have to check marriage records. A woman may have acquired property through inheritance before she married. (One clue to this is if she is the seller. In this case, her name often would appear before her husband's in the deed.) Check marriage records to find her maiden name, then check the grantee index under that name.
17. Use probate records to complete chains of title or to supplement information. Letters testamentary give death dates; inventories provide lists of property. These records will tell the researcher about the heirs, whose names and addresses often appear in the records.
18. Use district court records, particularly the case files. The researcher may find references in deed records to a property being deeded because of the settlement of a civil suit. Write down the case number; date, if given; and the names of the parties involved. Read the contents of the case file, which may include partition maps and invaluable clues to the people involved.
19. Keep going back in time in the legal records to the creation of the subdivision, if you are dealing with subdivided property.

20. Look at subdivision plats in the county clerk's office. Plat maps have their own indexes.

21. Continue searching until you come to sovereignty of soil. Records at the General Land Office also are informative.

What will you have?

1. A complete legal record of a property.
2. The names of all owners.
3. An idea of how the property came together to create a landscape, if the research is on a landscape level.
4. Names of potential informants.
5. Clues to finding information in newspapers, city directories, etc.
6. A framework for writing a history of the property.
7. A way to evaluate the accuracy of information provided by informants or appearing in secondary and other primary sources.
8. Clues to what questions to ask informants.

SECTION 3. FIELDWORK GUIDE AND METHODOLOGY

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INTRODUCTION

The following chapter provides guidance and a methodological approach for completing field investigations for agricultural properties in Texas. This guidance describes the process of identifying and documenting agricultural properties in the field through three basic activities: Pre-Fieldwork Task, Fieldwork Task, and Post-Fieldwork Task. Within each of the three fieldwork tasks are step-by-step instructions that outline the actions necessary to complete a survey of agricultural properties. This guidance focuses on each of these tasks in detail and explains how field investigations relate to the other aspects of completing a historic resources survey. It provides instruction that is compatible with TxDOT's Standards of Uniformity (SOUs) and it should be used for conducting field investigations for transportation-related historic resources surveys in rural settings. Since the basic methodological approach follows the SOUs, these guidelines can be used for surveys of non-agricultural resources and in different settings. The key for a successful survey, regardless of the setting or type of resource to be recorded, is good planning at the outset. Such a step will ensure greater consistency in the gathering of information, make efficient use of time in the field, and facilitate subsequent analysis and evaluation for the preparation of the survey report.

PRE-FIELDWORK TASK

The first activity in completing field investigations for agricultural properties is the Pre-Fieldwork Task. This task includes the actions a historian takes while preparing for a reconnaissance- or intensive-level survey. One purpose of this task is to assist a historian to identify historic properties (parcels of land within delineated boundaries) and associated resources (specific features or elements within a property). A second purpose is to aid the historian to distinguish properties and resources that retain the ability to convey significance under the National Register Criteria for Evaluation. Much of the information included in this task may overlap with the data gathered for the preparation of a Research Design; however, the guidance included herein is intended to outline all pre-fieldwork steps that should be completed prior to initiating fieldwork.

The Pre-Fieldwork Task has five steps that the historian should complete. These are briefly noted below and described in more detail later in this section:

- Step 1: Gathering maps, aerial photographs, and parcel and land ownership information.
- Step 2: Reviewing secondary sources available in libraries, archives, and online.
- Step 3: Synthesizing information from Steps 1 and 2 and preparing field maps.
- Step 4: Contacting property owners if right-of-entry (ROE) is needed, county historical commissions and local governments, county extension agents, Texas Agricultural Experiment Station personnel, and libraries and archives in the area of the survey, if needed, identified during preliminary research efforts.
- Step 5: Assembling field maps and other information in a format easy to reference during fieldwork, safety gear, cameras, survey forms, photo-logs, paper for sketch plans, compass/GPS unit, and voice recorder.

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Undertaking the five steps listed above for pre-field preparation in a systematic and thoughtful manner will help historians anticipate what they will see during fieldwork. The activities presented herein also will save time in the field and help focus attention on properties and resources that require further assessment and evaluation. Specifically, thorough preparation prior to fieldwork ensures that a historian is:

- Familiar with properties and resources that have been recorded and assessed previously.
- Familiar with the history of the county and general area where the work is being proposed.
- Knowledgeable about the important historical periods of development and themes that might be reflected in properties and resources.
- Knowledgeable about the types of agriculture present during the historical and more recent periods.
- Prepared to identify and record potential rural historic landscapes and agricultural properties and resources.
- Able to identify potentially useful in-field contacts with property owners and other knowledgeable individuals.
- Able to identify topics and details that need more research in the field.
- Able to recognize situations where field conditions differ from expectations based on pre-field activities.
- Able to adjust research, survey, and recording strategies if field conditions require it.

Step 1: Gather Maps and Other Materials

The historian should first gather maps and aerial photographs that can be analyzed and compiled into a format for use in the field. Many of these materials are identified and discussed in greater detail in the Section 8, Cartographic Data and Geographic Information Systems (GIS).

The procedures detailed in this first step of the Pre-Fieldwork Task enable the historian to conduct subsequent field investigations in a more informed, efficient, and focused manner. For example, assembling the cartographic and other imagery in chronological order in one location helps the historian to understand changes to parcel sizes, development of transportation infrastructure, relationships of properties to community and trade centers, relationships of properties to surface water resources, and locations of historic-age resources that might not be visible from public roadways. General Land Office (GLO) and county appraisal district data help ensure that the historian has accurate property ownership and location information, particularly in areas where individuals own more than one parcel, or where the parcel on which the homestead designation is declared is set apart from the parcel(s) on which other agricultural activities are carried out. The imagery and land data are two important factors in the preliminary identification of historic contexts that are appropriate to the area subject to be surveyed.

During Step 1, the historian should gather the following types of items and data:

- **Historic and current topographical maps**
Topographical maps, either alone or overlaid with other maps, familiarize the historian with the survey area. The maps enable field personnel to locate the area spatially and orient the

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historian to surrounding areas, water resources, vegetation, and topography. These maps provide historic period baselines for the appearance of the survey area and any subsequent changes, including changes in property lines and property functions. They sometimes depict potentially significant facilities and government programs in the general area that may provide direction for research.

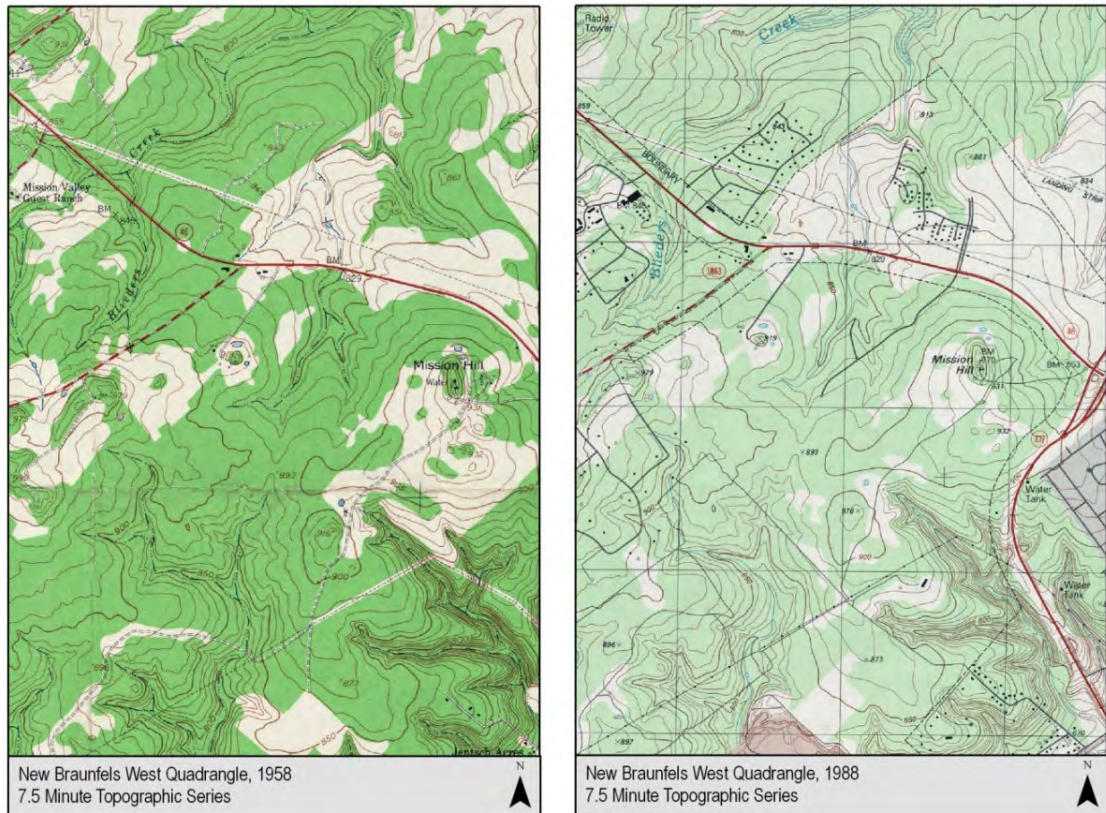


Figure 3-1. Details of USGS New Braunfels West Quadrangle Maps, 1958 and 1988. One way a historian may use maps is by completing a side-by-side comparison of topographical maps from different years (as shown above) to identify a variety of changes that occurred over a specific period of time. This side-by-side comparison helps the historian understand developmental patterns and how changes may affect the overall landscape and individual agricultural properties and resources within a project area. A comparison also may provide information about historic names and functions of specific features and landmarks. If possible, the historian can also overlay topographic maps from different years in a GIS-based program to see where landscape and individual properties have changed.

- **Historic and current aerial photographs**

Historic and current aerial photographs fulfill many of the same functions as historic and current topographical maps, although they lack the notations that make topographical maps particularly valuable. For some survey areas, they also may provide imagery that predates the earliest topographical maps.



Figure 3-2. Historic Tobin (1937) and Current Bing (2012) Aerial Photographs. Comparing aerial photographs from different years enables the historian to understand changes that have occurred over time. The historian should examine aerial photographs for changes in parcel sizes, circulation patterns, road networks, and vegetation. The historian may also use aerial photographs to identify historic-age agricultural properties and resources that may not be visible from public roads and ROWs.

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- **General Land Office (GLO) grant map for the county**

County-level GLO maps are also helpful sources in Task 1, because these maps depict original land grants that can provide historians with information about the history of land claims. This information can then be integrated with data available from county appraisal district and county tax assessor-collector records. These maps identify associations with organized colonization efforts, and they visually depict areas that were targeted for earliest claims and, in some cases, settlement.

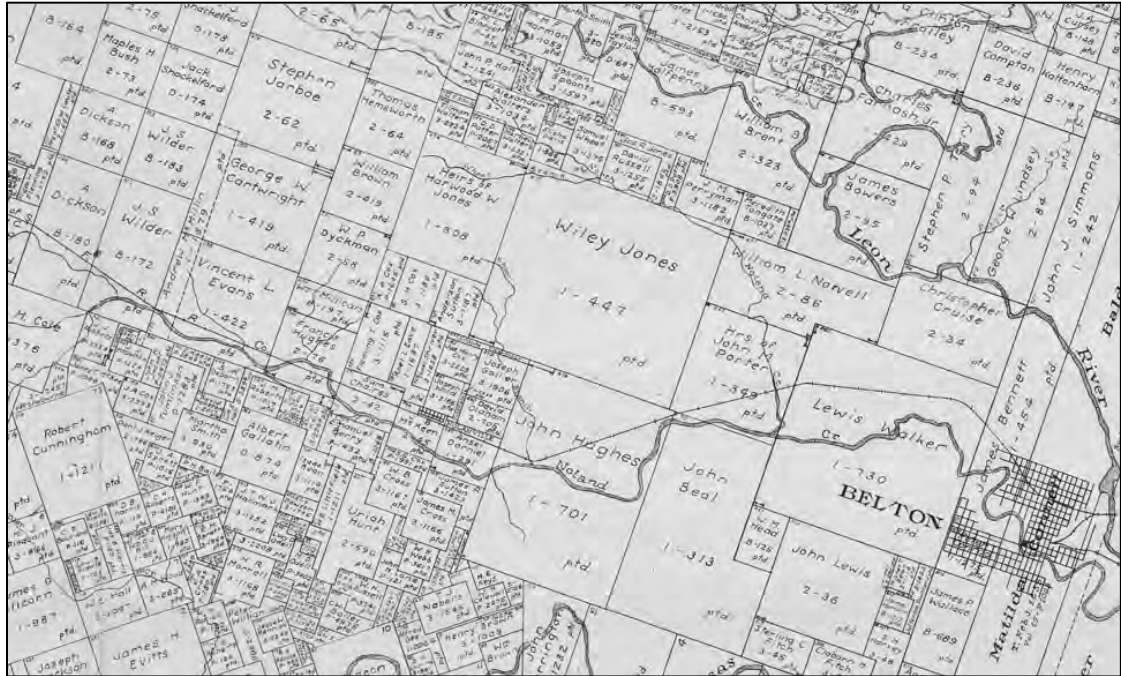


Figure 3-3. Bell County General Land Office Map. This cropped image from a map published by the GLO in 1945 shows original land grants and natural and man-made features in west-central Bell County. Historians may use land grant maps, such as the one shown here, to identify original land grants. In order to identify the original land grant in which a specific property is located, it is most helpful to consult current aerial photography to find points of reference such as major rivers, crossings, and roads. More information regarding the use of land grant maps (and other types of maps) is found in Section 8, Cartographic Data and GIS.

One of the most helpful sources of information for Task 1 is county appraisal district (CAD) and corresponding tax data, which include ownership and parcel information. First, it is recommended that CAD maps (when available electronically) are overlaid on current aerial photographs to identify which parcels are located within or partially within the project's Area of Potential Effect (APE) and to determine their size and relationship to the project.

Additionally, CAD data derive from GLO-level information updated to record parcel-level ownership. Such data identify current ownership, owner addresses, acreages, grant/survey names and numbers, property values, the existence of improvements, and land use classifications. Except in cases where the current owner has held the property for a long

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time, appraisal district forms usually include a reference to the deed record volume and page that recorded transfer of the property to the current owner. This type of information may prove especially helpful for intensive-level surveys when deed research is anticipated. It also is useful in identifying the parcels on which improvements are located and their associations with adjoining parcels on which other agricultural activities are carried out. In many counties, appraisal district records are available online.



Figure 3-4. Screen Capture from Williamson Central Appraisal District, Williamson County. Like many county appraisal districts in Central Texas, the Williamson Central Appraisal District uses GIS to allow the public to see the boundaries of legal parcels throughout the county. Historians may search appraisal district parcel records by address, owner, account number, or property ID number. There is often an advanced search option that allows searches by abstract/subdivision, neighborhood, acreage, block number, and lot number. Most importantly, identifying the boundaries of legal parcels is a very effective tool that enables the historian to determine the limits of a particular agricultural property. Please note that the screen capture does not show all of the data that are available online, as noted by the scroll bar at the bottom right-hand corner.

Step 2: Review Historical Data

Step 2 of the Pre-Fieldwork Task is the literature review phase. During this step, the historian should review secondary and online sources and identify those readily accessible at major repositories and those available only locally. Reviewing secondary and online information prior to fieldwork is beneficial in many ways:

- Identifies properties that have been designated as historic
- Alerts the historian to the existence of potentially significant properties that may not have been designated
- Helps interpret the data gathered during Step 1
- Provides local, county, state, and even national contexts for agricultural architecture and landscapes that might be encountered in the field

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- Identifies sources of information that may be unique to local repositories

The historian should assemble bibliographies for on-site research prior to fieldwork. These bibliographies can be based on the literature review, general information available in *The New Handbook of Texas*, other online sources, and entries in the *Historic Sites Atlas*. All of these readily available sources help the historian identify other sources that are only available in or near the project area. County histories, theses, and dissertations, in particular, often cite sources that are county- and community-specific, as well as collections held privately or in city, county, and regional repositories proximate to the survey area. For more detailed information about research materials, see Section 2, Research Guide and Methodology.

Sources that should be reviewed during Step 2 include:

- **The New Handbook of Texas**

The New Handbook of Texas can be a starting point to access the histories of county development and broader contextual information about agricultural products, government programs that have had an impact on production, legislation that has influenced the appearance of cultural properties and resources, multi-year weather events (droughts) that have affected production, and single-event catastrophes (freezes, floods) that have affected both production and cultural resources. *The New Handbook* should be considered as a general source and should only be used as a starting point for research because many of the histories are incomplete and require fact-checking in the research phase. The bibliographies that are provided at the end of each article identify secondary sources and a limited number of primary sources that may be reviewed during pre-field or on-site research.



Figure 3-5. Screen Capture from The Handbook of Texas Online. The handbook's search engine uses a keyword search that can be further refined by searching the keyword anywhere in an article, in the byline, or in the title. A second search can be conducted within the returned article results. The articles also have hyperlinks to other handbook articles. These hyperlinks often prove useful to gathering additional pertinent historical data.

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- **Other print sources**

The historian should also investigate other print sources, such as those listed in Section 2, Research Guide and Methodology. These include county histories, general agricultural literature, soil surveys, and cultural resources management (CRM) reports. Published county histories, master's theses and dissertations, and the text that accompanies soil survey publications and focuses on county-level and agricultural history topics are particularly helpful for reconnaissance-level surveys because they provide information that can be used to identify preliminary lists of historic contexts. They are sources for a broad overview of local history and they identify themes and cultural resources having local significance. They also provide information about local residents who may be of importance. Agricultural literature that focuses on specific activities is helpful in preparing for intensive-level surveys after identification of pertinent historic contexts. At that point, more-specific county-level and topical publications such as cemetery inventories and published sources listed in Section 2, Research Guide and Methodology should be consulted. Finally, collections listed in Section 2, Research Guide and Methodology, particularly those that are associated with the Texas Department of Agriculture's (TDA) Family Land Heritage program and described in TDA's annual publications, should be consulted to identify farms and ranches in the project area.

- **Online sources**

Online sources listed in Section 2, Research Guide and Methodology such as *The Portal to Texas History* provide access to Texas-focused primary and secondary published, manuscript, and photographic resources that otherwise may not be readily accessible to researchers. *Growing a Nation* and *The Core Historical Literature* provide access to specific and general studies that may be helpful in context development and identifying specific property types.

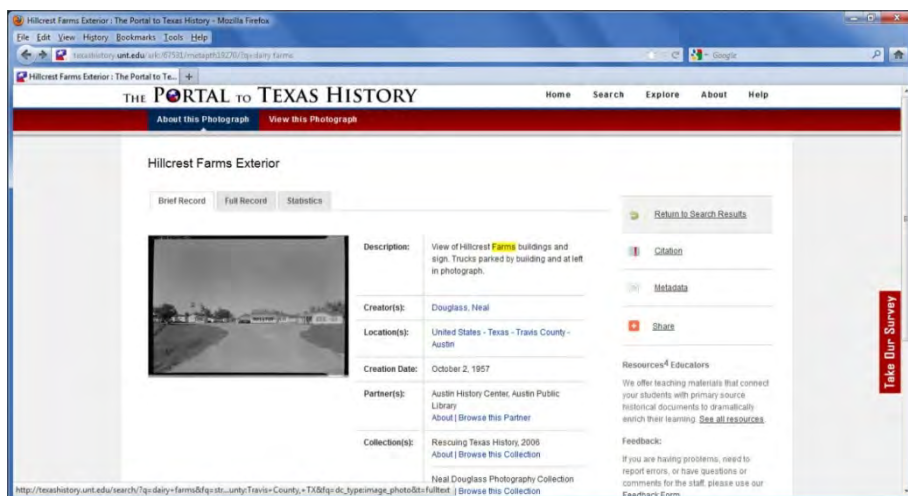


Figure 3-6. Screen Capture from The Portal to Texas History. This figure is a photograph of a dairy farm in Travis County and illustrates just one example of many kinds of materials available through this online collection.

The Portal to Texas History website contains textual materials such as books, government publications, reports, newspapers, maps, and photographs. The historian can conduct a keyword search within the entire database or within the categories of books, maps, photos, and newspapers. Further refined searches include searching by full text, metadata, title, subject, and creator. It is important to use a variety of keyword searches to yield relevant results. For example, searching by a property owner's name may not produce relevant results, but searching the town where the property is located may yield different and more pertinent results. Bibliographic information is shown to the right of the image and includes a description and other information. When available, the information also includes the creator(s), location(s), creation date, and contributing partner(s). The example shown is a photograph of a dairy farm in Travis County from 1957.

- **Historic Sites Atlas**

As required by TxDOT SOUs, historians should review the THC-sponsored *Historic Sites Atlas* during pre-field activities to identify properties and resources that are listed in the National Register of Historic Places (NRHP) and designated as a Registered Texas Historic Landmark (RTHL) or State Archeological Landmark (SAL). In addition, the Atlas identifies Official Texas Historical Markers (OTHM) that can provide property-specific or contextual information about the project area's history and development. In some cases, the *Atlas* also identifies resources such as cemeteries that have been identified by THC or county historical commissions but have not been officially listed or designated.

The *Atlas* is not completely current and, like the *Handbook*, requires fact checking. Per TxDOT SOUs, historians must look beyond the survey area to account for all properties and resources potentially associated with the area. The historian must then depict all collected locations on the field map developed during Step 3 of the Pre-Fieldwork Task. Finally, the historian uses the associated NRHP, RTHL, OTHM, and SAL data to identify appropriate historic contexts.

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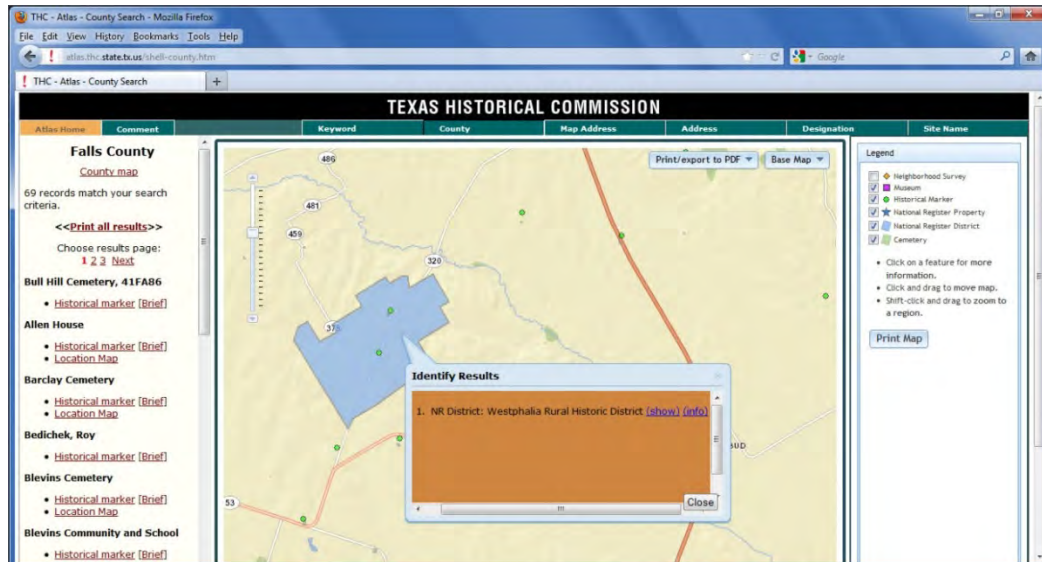


Figure 3-7. Screen Capture of the Historic Sites Atlas from the Texas Historical Commission. The historian searches the Atlas using one of several options: keyword, county, map address, address, designation (such as NRHP, RTHL, and OTHM), and site name. Within the keyword, county, and site name searches, the search can be further refined to include one or more of the following: historic county courthouses, NRHP properties, SALS (buildings only), historical markers, cemeteries, museums, military sites, sawmills, and neighborhood surveys. The results are displayed on the left menu. Clicking on Location Map under each record will highlight the location on the map located in the center. From the base map, the historian may print/export the record as a pdf. The base map may also be changed to a satellite, topographical, or street map. Clicking on the map will show a pop-up menu with further information on the record. The menu to the right of the map allows the historian to select the layers visible on the map.

Step 3: Synthesize Material and Prepare Field Map

Next, the historian should complete Step 3, which includes preparing a field map that incorporates the information compiled during Steps 1 and 2. A detailed field map should have an up-to-date aerial photograph as its base map. If good-quality aerial photography is not available, a topographic map may also be used. However, as discussed in the next activity, the Fieldwork Task, using the most up-to-date aerial photography is a vital part of making sure that resources and properties are not missed during fieldwork.

Once the base map is selected, the field map should show the parcel boundaries; illustrate the survey area (often the parcels within or partially within the APE); delineate the APE; include the existing roadway and proposed improvements, right-of-way, and easements; and identify previously recorded properties and resources. GIS-based programs are an effective tool to create these types of maps that synthesize the information onto one map. Section 8, Cartographic Data and GIS provides additional information on GIS-based mapping.

Assembling the information onto a single map helps the historian understand changes to parcel sizes, development of transportation infrastructure, relationships of properties to community and trade centers, relationships of properties and resources to surface water resources, and locations of historic-

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age resources that might not be visible from public roadways. GLO and CAD data help ensure that the historian has accurate property ownership and location information, particularly in areas where individuals own more than one tract. The imagery and land data are two other important factors in the preliminary identification of historic contexts that are appropriate to the survey area. A detailed field map also ties inventoried properties and resources to the legal record, helps assess accuracy of property-specific and property-general research, and helps suggest the limits or boundaries of historic landscapes.

Field maps should depict:

- **Roadways and project-related limits**

Conformity with TxDOT SOUs requires the historian to provide a map depicting the applicable highway, the proposed project limits, existing and proposed new right-of-way (ROW), easements, and the APE. Field maps showing this information help the historian to identify previously recorded and designated properties, to focus research, and to prepare a Research Design. The historian or assisting GIS staff will need to obtain engineering data from TxDOT or their respective clients. GIS programs such as Esri's ArcGIS can be used to incorporate engineering data onto aerial photography.

- **Previously designated historic properties**

Labeling previously designated historic properties and resources (NRHP, RTHL, and SAL) and subject markers (OTHM) on a map conform to TxDOT SOU requirements. The historian or assisting GIS staff can retrieve the *Atlas* layers directly from the THC, and they can be overlaid on project field maps. Identifying previously designated properties and resources at the outset of field investigations enable the historian to better assess potential effects while in the field, and such an assessment must be included in any historic resources survey.

- **Parcels taken from the county appraisal district maps**

A field map that depicts county appraisal district parcels helps identify the limits and extent of the parcels that the historian must study and record. In many cases, the historian or assisting GIS staff can obtain parcel data by contacting the CAD GIS staff or by downloading shape files directly from the CAD website. The parcel boundaries link the cartographic depiction of a property to the textual information available in appraisal district maps. The labeling of county appraisal parcel information also links recorded properties and resources to the legal record. This information is critical for the historian to evaluate any effects that the proposed project may have on a historic property.

- **Parcels and locations of ROE supplied by TxDOT**

Prior to undertaking any field investigations, the historian must obtain permission from property owners before entering a parcel of land. Otherwise, fieldwork must be completed from public ROW. Since TxDOT gathers property owner information as a routine task for many roadway improvement or new alignment projects, the agency asks property owners

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for written permission to access a property. Written permission and documentation of right-of-entry (ROE) should be obtained from TxDOT. While ROE may not be possible, required, or warranted as part of contracts to complete reconnaissance-level investigations, ROE should be attempted for all intensive-level surveys unless otherwise instructed by TxDOT-ENV. Field maps should note parcels and locations where ROE has been granted or denied. This notation enables the historian to avoid trespassing, an important concern for TxDOT, which respects and abides by property owners' rights.

- **Landmarks**

If the base field map is not a topographical quadrangle, then it is important to notate prominent or distinctive natural landmarks that can assist in identifying boundaries that appropriately limit the spatial scope of a historic landscape. Roads and waterways should be labeled, and a north arrow included.

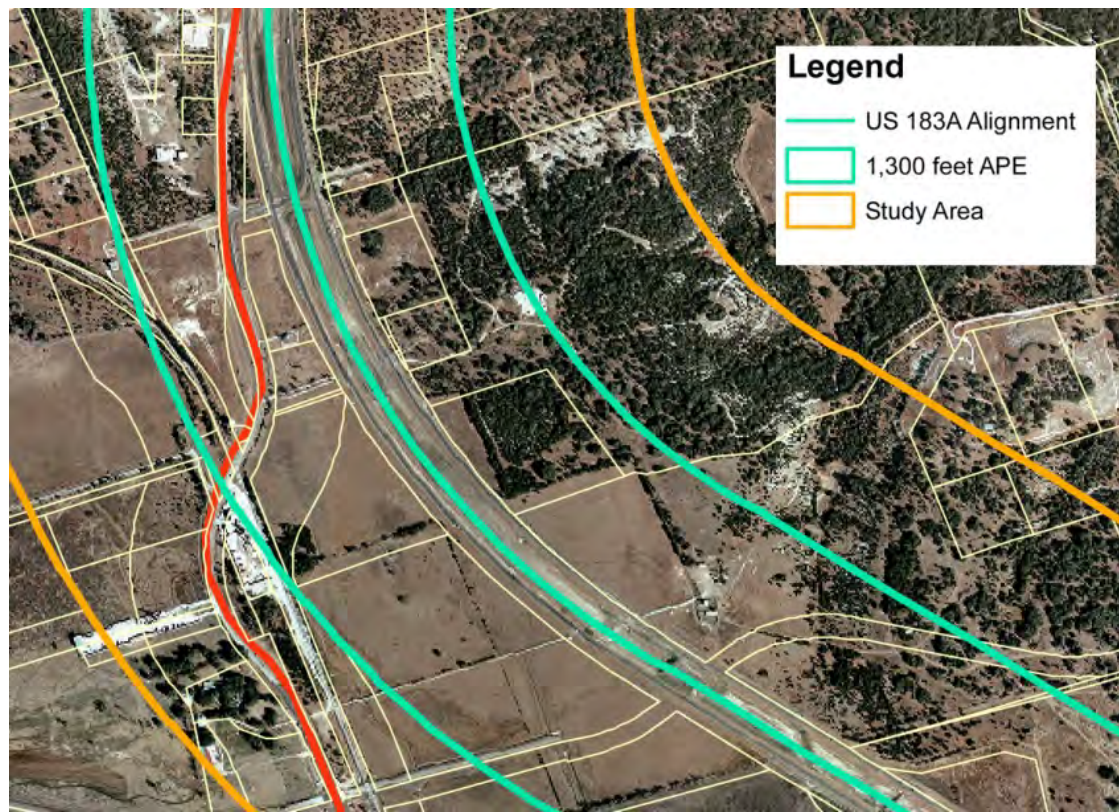


Figure 3-8. Example of Field Map. This detail from a field map shows how GIS can be used to delineate existing right of ways and alignments, the APE, and study area limits on a current aerial photo from TNRIS. The preparation of such a detailed map is an effective tool to identify properties that should be identified and documented for a historic resources survey in a rural setting. The parcel boundaries delineate the land and associated buildings and structures on an agricultural that may be affected by a roadway project.

Step 4: Communicate with Local Contacts and Repositories

Step 4 of the Pre-Fieldwork Task involves contacting property owners and other likely informants prior to fieldwork. Contact with property owners is necessary to obtain ROE, when required by the project; property owners also may provide useful information about cultural resources. County historical commissions (CHC), certified local governments (CLG), local heritage organizations, county extension agents, and personnel associated with Texas Agricultural Experiment Stations are likely sources of information about properties, resources, collections not part of formal archives and libraries, and potential oral informants. Local archives, libraries, and newspaper offices often hold collections that bear directly on cultural resources and that are not available in regional institutions.

It is important that the historian be well prepared to talk to local contacts prior to communicating with them. This involves having a set of questions ready to discuss with each local contact, which is outlined below.

- **Property owners**

Historians should consider contacting the property owner when maps and aerials suggest that buildings, structures, and other resources may not be visible from the public ROW or are so distant that recordation and preliminary assessments during reconnaissance-level surveys are difficult or impossible. Property owners may have direct, long-term involvement with the property and thus may be able to answer questions relevant to the investigation. Or, they may be able to refer the historian to local residents who have specific knowledge about the area. The types of questions that a property owner may be able to answer are:

- How old are the buildings?
- Have you/your family done any major work on the buildings?
- How long have you/your family owned this property?
- Do you know who owned it before?
- What type of agricultural activity do you do on your property? To your knowledge, has that always been the activity that has occurred on this property?
- Have you or your family members increased or decreased the size the property? If so, when and where?
- Do you know of anyone who could answer questions about agricultural practices in this area?

While this is not a comprehensive list of questions to ask a property owner, it provides a foundation of questions to build upon. Research on specific locations may elicit further specific questions.

- **County historical commissions (CHC) and certified local governments (CLG)**

The historian should contact local organizations devoted to history and historic preservation, such as county historical commissions and certified local governments, to determine if properties and areas of interest are present in the project area (see THC's website, <http://www.thc.state.tx.us>, for an updated contact list for each CHC and CLG).

These contacts may also be able to provide a map or a list of resources that are locally designated with the project area. Historians should look for these resources during fieldwork and note the local designation in their Historic Resources Survey Reports (HRSR). While many properties of historic value are enumerated in THC's *Historic Sites Atlas*, all counties have numerous properties and resources that are potentially significant and known to local residents, but not recorded or registered. Members of the county historical commissions and personnel with certified local governments are excellent sources of information about such resources. They may be able to identify individuals who are likely informants, and local collections that are in repositories or private hands. Sending a map of the project location or the survey area may help facilitate the discussions with the CHC and CLGs, particularly for projects in rural locations.

Key questions to ask of CHCs and CLGs include:

- Do you know of any important historic resources that may be located in our project area? If so, what are they and where are they located?
- Are there any locally designated properties or historic districts in our project area? If so, what are they and where are they located? Can you send us a map that shows their location?
- Who are local informants who can provide information about the area? Are you willing to assist in making contact with them?
- Do you, a local historical organization, or heritage organization have records regarding historic resources such as manuscripts, books, local histories, oral histories, vertical files, photographs, and maps? If so, what are the hours of operation?

- **Local repositories and special collection**

The historian should contact archivists and librarians at local repositories and special collections to make appointments and complete research on site, if applicable. By searching the internet for local repositories in the area and reviewing the list of regional archives and libraries included in Section 2, Research Guide and Methodology, the historian can determine what repositories should be visited during on-site investigations. In addition, each county is the location of one or more public libraries or museums, many of which have local history and genealogical collections that include published county, community, and family histories; cemetery inventories; biographical and topical file materials; historic photograph collections; oral history recordings and interview transcriptions; and census, newspaper, and other microfilm records. In many cases, the limited printing of history, genealogy, and cemetery publications means that there are few, if any, copies outside of those held in the local library or museum. Finally, local newspapers sometimes retain morgues of original or microfilmed papers. While many such local newspapers have been microfilmed and are available at the Center for American History, the Center's holdings are

far from exhaustive. Local newspaper offices or archives often remain the best sources for such materials, which should be used during intensive-level research.

Historians should note the hours of business for the repositories. Many are closed on certain days, have limited hours in which they operate, or require an appointment. The historian should describe the survey area and/or specific agricultural properties in question, and if possible, provide a location map to aid the archivists and librarians in their search for materials.

While local librarians and archivists can be a great resource for historians researching agricultural properties, these professionals often help the most when the historian has specific research topics. In general, however, the following questions provide a starting point for eliciting helpful information:

- What materials in your collection include information about the overall and agricultural history of the area?
- What materials in your collection include information about specific properties or families?
- Does your repository retain historic maps of the area, and are they accessible to the public?
- Does your repository retain newspapers or other long-term local publications? Are they cataloged?



Figure 3-9. Interior View of Sophienburg Museum Archives in New Braunfels (copyright Sophienburg Museum).

- **Local heritage organizations**

At least three private heritage organizations are located in the 13-county study area: Preservation Austin, the San Antonio Conservation Society (SACS), and the Sophienburg Museum and Archives in New Braunfels. While Preservation Austin and SACS focus almost exclusively on urban and suburban properties, SACS has, in recent years, recognized the

historical and cultural value of rural agricultural properties and resources. Using volunteer labor, SACS inventoried numerous Bexar County farms and ranches and reached out to interested parties in adjacent counties. Records are maintained at the SACS archive. The Sophienburg Museum and Archives includes six major collections with primary and secondary source information, including historic map and photographic collections. It is likely that similar organizations throughout the state exist; they may provide similar types of local information and may be good sources of contacts with individuals knowledgeable about local history and cultural properties and resources. As with other repositories, when contacting and/or visiting these organizations, it is helpful to provide a location map to aid the staff in locating relevant research materials.

Since contacts at local heritage organizations may have information regarding specific properties and retain materials, the baseline questions to ask these groups are similar to those discussed above and include:

- Do you know of any important historic resources that may be located in our project area? If so, what are they and where are they located?
 - Are there any locally designated properties or historic districts in our project area? If so, what are they and where are they located?
 - Are there any individuals within your organization who can provide information about the area? Who are they and can we contact them directly?
 - Whom should we contact at the city offices who might be knowledgeable about local historic resources?
 - Do you have records regarding historic resources such as manuscripts, books, local histories, oral histories, vertical files, photographs, and maps? If so, what are your hours of operation?
-
- **County extension agents**
Historians may also consider contacting the county extension agents if there are particular questions about agricultural practices in an area. The work of the U.S. Cooperative Extension began in Texas in 1903; county agents have been a part of the Texas agricultural landscape since 1906, when the nation's first agent began work in Smith County. A Department of Extension began at the Agricultural and Mechanical College (now Texas A&M University), and the legislature authorized county commissioners' courts to underwrite county extension work with the school. Passage of the Smith-Lever Act in 1915 confirmed the existing system of agricultural extension, which was formally assigned to Texas A&M in 1916. County agents in each county worked with local residents to identify problems, provide solutions based on scientific research, and implement the work that focused on agricultural production. In the 1960s, the program established agricultural research and extension centers throughout Texas. Recently renamed the Texas AgriLife Extension Service, the program has county extension agents who serve in a variety of outreach educational roles. Typically, the agents are sources of information about agriculture in their county. They may be able to provide

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helpful information about the development and/or decline of agricultural activities, particularly in recent years. They also may be able to provide contact information for local farmers and ranchers who would be knowledgeable informants. The historian should describe the survey area and/or specific agricultural properties in question and if possible, provide a location map to aid the agents in their search for information.

Baseline questions for the county extension agents may include:

- What agricultural activity is currently occurring in the project area? Why is the area well suited for that activity?
- To your knowledge, has the agricultural activity changed in this area? If so, what factors caused this change? What features on the landscape will indicate this previous agricultural activity?
- **Texas Agricultural Experiment Station, Blackland Experiment Station**
Another possible source of information in Central Texas is the Blackland Experiment Station. The Blackland Experiment Station, now part of Texas AgriLife, Blackland, was created by the Texas Legislature in 1909 as part of the Texas Agricultural Experiment Station system established in 1887. In 1927, the station was located near Temple, where it was home to researchers associated with the U.S. Department of Agriculture, Soil Erosion Services (later Soil Conservation Service [SCS]), Agriculture Research Service, and Texas A&M's Texas Agricultural Experiment Station. The station was associated with the Elm Creek Project of eastern Bell County and adjoining counties, the largest demonstration project in the United States in the 1930s. Research at the station focuses on soil, water, and crop problems, with special attention paid to cotton, corn, and beef cattle. Records generated at the station include weather and air temperature data for 1914 to current and monthly precipitation totals from 1913 on. Historians can use this information to understand agricultural trends and development in a survey area, in addition to how and why a specific agricultural property's function changed over time.

Historians may consider asking the scientists the following questions:

- What information is retained at your repository that is specific to the project area?
- What atmospheric or crop changes, if any, have occurred in the project? Why has this occurred?

Step 5: Assemble Materials for Use in the Field

Step 5 is the final step in the Pre-Fieldwork Task and consists of assembling supplies for documenting properties and resources during fieldwork. Historians should pay careful attention to the gear, tools, forms, and other materials that ensure consistent recording and efficient use of time. Doing so will allow the historian to focus on identifying, recording, and evaluating properties and resources in the field. Also, obtaining proper field materials will prevent unnecessary expense and delay while in the field.

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During this step, the historian should assemble the following items:

- **Safety gear**

Safety gear may consist of safety cones, if the survey is occurring on a busy road; flashing or revolving beacon car lights; safety vest; hard hat; steel-toed shoes; and long pants. It may be helpful to have sulfur powder available to ward off chigger bites if the work requires walking through fields.

- **Camera**

The historian must use a film or digital camera that meets the minimum photography requirements set by TxDOT SOUs (1200 x 1600 pixel resolution for digital images). The historian also should have a backup battery and an SD card or other portable digital storage device. If the survey encompasses a sufficiently large area with numerous properties, it is a good idea to download images at the end of each day and compare them with the written photo log. This allows for a back-up of digital images in case the images are erased on the SD card and a quality control check to ascertain if any photographs need to be retaken.

- **Photo-log form**

Surveying historians should keep a photo log that includes information such as the project name, project ID number, address or UTM of the resource, number associated with the resource, name of the photographer, date the photograph was taken, a brief description of the object photographed, and notation of the direction the camera is facing. To meet the requirements of TxDOT SOUs, the photo log should enumerate views that include oblique and multiples of facades and architectural details for each resource located on the property. Other views should record the associated property and broader landscape, including the relationship of the property to the road and to nearby resources. Additional photographs should record alterations that have compromised the historic integrity of a resource.

- **Survey forms**

The historian should use survey forms to record information while undertaking field investigations. At a minimum, the form should be designed to gather the type of information necessary for reconnaissance- or intensive-level surveys, as applicable, and in accordance with TxDOT. The survey form should be used to note the location, setting, and physical attributes of each individual historic-age resource and, just as importantly, the entire property. While intensive-level surveys often make use of the THC Historic Resources Survey form, this document is not adequately designed to record the kinds of information needed for agricultural properties and landscapes. The THC survey form works well for buildings in an urban setting; however, it does not adequately address the kinds of issues or features that are common to agricultural properties and landscapes.

The survey form for agricultural resources, properties, and landscapes facilitates and encourages the recording of spatial relationships among individual resources, building

clusters, and/or activity zones, as well as landscape features, circulation networks, boundary demarcations, and land uses. In addition, the historian must record information relative to the location of any work associated with the proposed project. The historian should also document what features or resources are present on the property and/or within the proposed project location and how they may be affected. The historian should use the form to assist with the identification, documentation, and evaluation of properties for NRHP eligibility, as well as to record information for assessing potential impacts to the character-defining features of a historic property. Map and photo references ensure that all of the field data can be cross-referenced and used in subsequent analysis phases. Gathering field data in a systematic and organized manner is a critical step in the next activity, the Fieldwork Task, and contributes significantly to the preparation of the survey report.

- **Paper for sketch plans**

In some cases, the historian may need to create a sketch plan of the components of a property's domestic work zone and agricultural work zone in relation to each other and the property's fields. This may be particularly necessary if the property has several outbuildings and sheds. As a result, historians should bring gridded paper to prepare preliminary sketch plans, which should be executed in pencil and include all site elements. The plans should suggest the limits of any landscape present, and include a north arrow. It can be helpful to base the final plan on an enlarged version of a current topographical quadrangle.

- **Compass/GPS unit**

Because roads rarely are oriented to true north, and some resources may be located at a distance from transportation infrastructure, a compass is often necessary to accurately complete photo-logs and survey forms. Historians can also use hand-held GPS devices to note directions and other locational information. In addition, GPS devices now can be attached to or are integrated into digital camera systems that can record camera views when photographs are taken.

- **Voice recording device**

A voice recording device can be helpful as a backup to written notes when describing resources in the field. In addition, a recorder usually captures a more complete record of information provided by local informants than written notes alone. As with the photo log, enough information should be included in a recording in order to link the information recorded with a specific property and resource.

FIELDWORK TASK

Sufficient completion of field investigations is paramount to completing reconnaissance- or intensive-level historic resources survey reports and thus should be undertaken in compliance with TxDOT SOU. This section of the report provides historians with guidance for completing fieldwork to identify, record, and assess agricultural properties and potential rural historic landscapes. The four steps in this task walk

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the historian through identification of historic and current agricultural activities on a property and associated resources for further analysis and evaluation later in the survey process. These steps also identify tools and guidance to recognize functional areas of agricultural properties, anticipated resources within each area, and the circulation networks within and between properties. Finally, this section outlines how to identify appropriate boundaries for individual properties and potential rural historic landscapes.

The historian should complete the following four steps during fieldwork:

- Step 1: Review and identify visual characteristics of individual properties and the general landscape.
- Step 2: Document resources and elements associated with individual properties and/or the landscape.
- Step 3: Complete on-site research tasks at local repositories and gather additional information from local informants.
- Step 4: Preliminarily assess significance and integrity based on observations and synthesis of information from field investigations and maps and aerial photography analysis.

Step 1: Review the Landscape and Properties

The historian should review the landscape and agricultural properties to determine the overall character of individual agricultural properties within the survey area and to ascertain if a rural historic landscape exists within the APE. The historian must take a holistic view of buildings, fields, pastures, vegetation, fences, circulation networks, community gathering places, and the relationships among these resources. Additionally, the historian should be mindful of intrusions that may affect the ability of the area or individual property to convey significance and a sense of the past. This fieldwork methodology section provides guidance for gathering information that is consistent with the National Park Service's (NPS) *Guidelines for Evaluating and Documenting Rural Historic Landscapes*; however, this fieldwork methodology supplements, rather than replaces, the NPS Bulletin and focuses on fieldwork tasks for Texas agricultural properties (National Park Service).

To review the landscape and individual properties, the historian should complete the following actions:

- **Identify Agricultural Activities**

First, when approaching the project area, the historian should focus on general land uses and agricultural activities within the survey area. To a limited extent, the historian should also examine adjoining areas to assess the general character of the land and how it is used for agricultural activities. This step provides for a better understanding of the existing quality of the greater project area, as well as the ages and types of agricultural properties present therein.

In Central Texas, there are three main land uses associated with agriculture: farming (cultivation), ranching, and dairying. On any given property, the historian may identify any

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or all of these activities, although one activity may be more prevalent now or in the past. As such, these activities are not mutually exclusive. The historian needs to be alert to visual clues that point to these three land uses in Texas:

- Farming – fenced or unfenced cultivated and/or plowed fields.
- Ranching – fenced improved or unimproved pastureland and/or fenced overgrown woodlands.
- Dairying – large hay and milking barns and other outbuildings with surrounding pastures; silos.

To identify agricultural activities on agricultural properties and landscapes, the historian should ask him or herself which of the above agricultural activities occur and occurred in the past on individual properties or within the landscape. To answer this question, the historian should look at the primary functional areas within an agricultural property, which typically include a domestic work zone, agricultural work zone, and associated land. They should pay attention to the interrelationship of landscape features, buildings, and structures. The functional areas and interrelationship of resources, driveways, fence lines, and fields help point to the kinds of agricultural activities that are occurring in the area and on the property. Historians should also look for tale-tell signs of agricultural activities, such as the presence or absence of fencing. Since livestock require fenced pastures, if a property has no fences surrounding its fields, it is likely not used for ranching. Another tell-tale sign in an agricultural property is the presence of a large hay barn or workers' housing, which may indicate the property's use as a dairy farm. If unexpected land uses and agricultural activities are found based on research, ask the county extension agent or other local informants about it. They may be able to point to additional sources that explain apparent anomalies.



Figure 3-10. Historic Farms in Falls County. This photograph shows two historic farmsteads in rural Falls County near the community of Westphalia. The lack of fencing is noticeable and contributes to a sense of openness in this part of the county, thus indicating that the land is currently used for cultivation.



Figure 3-11. Ranch Land Along the Bexar-Medina County Line. Fencing surrounds the property and livestock is seen in the background. Additionally, cross fencing and gates separate pastures, eliminating the open feeling present on the farm properties shown in Figure 3-10.



Figure 3-12. Agricultural Complex that Appears to Be a Dairy Farm in Bexar County. The elongated building in the foreground and gambrel-roofed building in the background are typical of the kinds of resources found on a dairy farm in Texas. This complex, off Boerne Stage Road in northern Bexar County, was identified during a windshield survey undertaken for this study. Further research is needed to confirm that this property has been a dairy farm.

Through background research and preparation of the Research Design, the historian notes if the general land use of the area is consistent with what was expected. For example, if research showed that sheep and goat ranching was the anticipated agricultural activity but historic-age dairying facilities are common throughout the area, the historian should conduct additional research regarding dairying in the project area, such as contacting the county extension agent or visiting the local library, to identify if it could be a significant historical theme.

- **Note Changes in Land Use**

Additionally, the historian should look for clues regarding changes in land use, such as the gradual suburbanization of a formerly agricultural area or a shift from rangeland to vineyards or raising horses. The historian should keep in mind that it is rare for one area to have been solely ranched or solely cultivated, although changing soil conditions and the introduction of irrigation are among the factors that may affect how an area could be cultivated over the long term. Rather, a layering of land use and activity often occurs on agricultural properties in Central Texas, since property owners usually grew and/or raised what was most profitable at the time based on market forces. For example, farmers in nearly every area in Texas grew or attempted to grow cotton in the early twentieth century. For these reasons, it is important to look at the historic land uses and agricultural activities in Texas as changeable and not static. Determining the land uses that are extant on the landscape is important in assessing how a rural historic landscape and individual properties reflect the period of significance.

To recognize changes of land use, the historian should look for remnants of former agricultural activities on a property or in an area. This can be seen in abandoned buildings. For example, a deteriorated milking barn that stands unused on a farm may indicate the property's previous use as a dairy farm. Remnants of older, unused landscape features may also indicate a change in land use. For example, irrigation features that have been partially filled in on a functioning cattle ranch may indicate that the area was previously cultivated.

As discussed above, if remnants of agricultural activities are found that were unexpected based on pre-field research, ask the county extension agent or other local informants about it, as they may be able to provide information about past land uses.

The images on the follow page show how changes in land use are visible from public roads and are indicative of a growing trend in one of the state's fastest growing areas.

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Figure 3-13. Agricultural Property in Falls County. The plowed rows and tilled field on the right show this field near Westphalia is used to cultivate crops. In contrast, land on the left has pastureland that suggests former farmland is inactive or used for grazing.



Figure 3-14. Suburban Development in Guadalupe County. Rapid growth along the IH 35 corridor has led to the conversion of large tracts of agricultural land into densely developed residential neighborhoods. Encroaching suburbanization diminishes the historic character and integrity of the area and introduces new building forms, land uses, and patterns of development that are not consistent with the agricultural traditions that have endured since the nineteenth century.

- **Recognize Functional Areas and Circulation Networks**

To understand how an agricultural property has operated over time, the historian must be able to recognize how clusters of resources and associated land are used and function, both now and in the past. This step requires the historian to look at the spatial organization of the resources on an agricultural property and to examine how the use of land, internal circulation networks, and the relationships of resources to each other operate collectively for agricultural endeavors. These resources are not necessarily distinct or clearly delineated from one another and may, in fact, overlap. Rather than detract from the historic character and integrity of a property, they reflect the heritage of land and its occupants and reinforce the dynamic quality and layered history that characterizes the rich agricultural traditions of Central Texas. Such patterns also exist throughout the rest of the state.

Within an agricultural property, the historian should look at the spatial relationships of resources and associated land as clues to understanding the historic use of that property. The spatial relationships can be easily understood and categorized into three functional areas: the domestic work zone, agricultural work zone, and associated lands (fields, pastures, and woods). As its name suggests, the domestic work zone is set aside for residential purposes and activities and contains at least one dwelling and associated outbuildings, such as garages, sheds, and cisterns. (See Section 5, Property Type Development for more information about resources found in the domestic work zone.) Landscaping is a feature that often sets this zone apart from surrounding land and can include trees, fencing, a lawn and decorative plantings and shrubs, oftentimes enclosed by a fence.

The agricultural work zone functions as a transitional area between the domestic work zone and surrounding fields, pastures, and woods. In the agricultural work zone, the historian will usually find barns, sheds, pens, silos, and other structures that directly support the kinds of agricultural activities that are or have taken place on the property. (See Section 5, Property Type Development for more information about resources in the agricultural work zone.) Internal driveways and paths will often emanate out from the domestic and agricultural work zones, which function as the heart or core of the agricultural property.

Finally, the last functional area on an agricultural property is usually the largest and includes the fields, pastures, and woods that have been used to cultivate crops or raise livestock. They are clearly a key component of any agricultural property, and the historian should be diligent in documenting, photographing, and evaluating the property's associated lands as resources within an agricultural property. Additionally, fences, windmills, and stock ponds are among the obvious types of resources that should be recorded in these areas. Resources such as silos or pens that are typical of the agricultural work zone may also occur in the associated land area. Tilled fields, grasslands, orchards, and other plantings are still other resources that the historian should consider and document.

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The historian can often recognize functional areas of the agricultural property because they are usually in distinct clusters. Sometimes they are separated by wire or barbed wire fence, wood or metal posts, and/or rock fences.¹ While some yards/fields are fenced when cultivation is the primary agricultural activity, fenced separations are most common on properties that focused on raising livestock because the main purpose of fencing is to keep the livestock separated from the domestic area at all times and work areas when necessary.

If fences are not present, the historian should observe the circulation patterns within the property, which often help to distinguish the functional areas. They primarily provide access to and physically link the different areas within the property, and they also access outside road and transportation networks. In some cases on properties where cultivation is the primary agricultural activity, two-track paths large enough for trucks surround farm fields and are located between fields. Circulation networks on ranches and dairy farms weave through pastures and wooded areas, and they connect feed- and water-troughs, man-made water retention features, and windmills. Circulation networks on properties that focus on livestock production may have two-track paths for equipment along the periphery of the pastures near fence lines, as well as paths through pastures and wooded areas.

The historian should also determine how a property's internal circulation patterns link to the transportation network beyond an individual property, and should review and document those connections during the review of the landscape. Often, the spatial organization of the resources, fields, and other elements within an agricultural property will be planned to maximize the ease and ability of the farmer or rancher to get his goods to market or to maximize the use of land. Railroads, vehicular roads, and, at least historically, rivers, are transportation networks that provide this connectivity from the farm/ranch to market. The historian should make note of the transportation network that is present within the survey area. Comparing and contrasting what is seen on the ground with current and historical maps will help the historian determine if transportation networks have changed significantly and how they may have played a part in the development of the area. For example, if a few late-nineteenth- and turn-of-the-twentieth-century properties are dispersed through the area, and more widespread 1920s properties are scattered throughout the area, that pattern may indicate that small rural roads constituted the area's main transportation network prior to the construction of an improved all-weather highway in the 1920s.

The historian also should observe how the property is oriented to external circulation networks. For example, if a main house and its associated domestic yard are oriented in a

¹ Rock fences are most often found in the southwest region of the 13-county study area, including in Bexar, Blanco, Comal, Hays, Travis, and Williamson counties. For more information about rock fences, see Laura Knott's *Historic Rock Fences of Blanco County*, a University of Texas at Austin master's thesis available at: <http://repositories.lib.utexas.edu/handle/2152/6322>.

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different direction than the roadway, there is a possibility that the road was realigned or the house predates the existing road. It may also indicate that the main house originally faced a smaller road that is located nearby. If this is the case, the historian should drive the nearby roadways to determine if an older roadway was previously the main access point for the property.

On the landscape level, a historian should also consider the transportation network between agricultural properties and community resources, as this may reveal developmental and settlement patterns within the surrounding areas, physically link properties to one another, and reveal potential ethnic/cultural/familial connections among property owners. This network includes proximity and connections to common agricultural community resources such as a processing facility, co-op, and/or shipping point (such as a freight depot), as well as a crossroads community and/or community gathering places (e.g., dancehalls, bowling halls, schools, general stores, and churches).



Figure 3-15. Aerial View Depicting Zones on a Ranch. This image illustrates the three distinction functional areas on a ranch; the domestic work zone (outlined in yellow), the agricultural work zone (outlined in white), and the pastures surrounding them. The functional areas are separated from each other by driveways (that serve as the internal circulation network) and fences. Source: Bing Maps.

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Figure 3-16. Aerial View of the Stolte Farm in Medina/Bexar Counties, 2012. This image illustrates that an agricultural property may participate in multiple agricultural activities simultaneously. This property includes more distinctive functional areas than the figure above (Figure 3-15), and specific features within the property are identified by number: 1. Historic domestic work zone; 2. Secondary domestic work zone with 1960s house, garage, and other ancillary buildings (note the fence to the east and south separates this area from associated fields); 3. Agricultural work zone that includes historic and non-historic outbuildings and structures; 4. Grazing pastures for cattle; 5. Tilled fields used for crop cultivation; 6. Unpaved road that is part of the internal circulation network. Source: Bing Maps.



Figure 3-17. Aerial View of Farm on CR 367 in Falls County, 2012. This image illustrates a farm with landscape features (a drainage ditch that bisects the property and contoured fields) that help indicate that this is a property that focuses on cultivation. The numbers on this figure correspond to the specific features on the property: 1. Main entry driveway that provides access from the public road to the domestic work zone; 2. Domestic work zone; 3. Agricultural work zone; 4. Fields that have been contoured to allow for water movement into the drainage ditch; 5. Driveway on the southeast side of the property that provides access to the fields; 6. Drainage ditch that runs through the center of the fields. Source: Bing Maps.

- **Identify Ethnic Concentrations**

Within Central Texas, a historian should record ethnic concentrations of the current and/or original property owners. Identification of ethnic concentrations can point to potential significance for historical associations and/or design qualities under National Register Criteria, if such concentrations are important and intact. Within Central Texas, the major ethnic groups are Germans, Czechs, Swedes, Mexicans, and Old Stock Anglos. The historian can identify ethnic concentrations within an area by completing the following activities:

- Conduct background research to determine if an ethnic concentration is or was present in the survey area.
- Ask local informants (such as property owners, CHC chairpersons, or local librarians) if a heavy concentration of a certain ethnic group is or was present in the survey area.
- Review the text of OTHMs within and outside the project area to determine if they point to ethnic concentrations.
- Look at the types of churches and the physical attributes (materials, detailing, etc.) of the church buildings located within and/or near the project area. They may indicate religious affiliations within communities, and architectural styles may be indicative of particular ethnic groups.
- Observe consistent stylistic influences or distinctive vernacular building traditions indicative of certain ethnic groups seen in the construction and design of houses (such as *fachwerk* on German houses) and/or other substantial buildings, such as barns, within and/or near the project area.
- Walk through publically accessible cemeteries and look at the names on the headstones, because they may indicate demographic shifts over time.
- Determine if social and fraternal lodges, community buildings, or other facilities are in the area, and if they are associated with specific ethnic groups.



Figure 3-18. Ocker Brethren Church in Bell County, Texas. Located along FM 320 in the rural community of Ocker, this OTHM indicates that the area was settled by Czechoslovakian immigrants in the late 1870s and provides a clue to the historian to look for significant ethnic concentrations.

- **Survey Appropriate Boundaries**

In surveying individual agricultural properties, a historian should review, document, and assess all contiguous parcels that a property owner holds, even if only one parcel is located within the APE. While it may not always be possible, feasible, or advisable in every situation (particularly at the reconnaissance level), the historian should attempt to observe as much of an agricultural property as possible from public rights-of-way or through right-of-entry. (See the discussion below regarding documentation for information about surveying properties.) Surveying the entire property will help ensure a holistic understanding of the agricultural property, its work zones and fields, and their relationship to each other. This will greatly help the historian to determine a property's significance individually or as part of a rural historic landscape. (See Section 6, NRHP Evaluation Methods and Guidelines for information about determining significance.)

Surveying and determining the boundaries for a potential rural historic landscape is a complex task that requires a review of topography and intrusive elements. As noted in the Pre-Fieldwork Task, a historian should prepare a field map with a USGS topographic map to help identify physical features (e.g., rivers, hills, and canyons) that may be appropriate boundaries for potential rural historic landscapes. While in the field, the historian should look for these features and see if natural physical features constitute a change in character of the area. Other potential boundaries when evaluating a rural historic landscape can be historic-age or non-historic-age intrusive elements that create physical boundaries (e.g., large roadways and man-made lakes), man-made elements that illustrate a change in land use (institutional, industrial, light industrial, commercial, or residential developments), or large infrastructure facilities (e.g., dams, power stations and substations, and airports). Much of the determination of where to delineate the boundaries of a potential historic landscape depends on the landscape itself and is highly variable; regardless, the historian should document the limits and character of the area being considered as a potential historic rural landscape and include that information in the survey report.

- **Recognize Continuity and Integrity Issues**

This section of the Fieldwork Task describes how to recognize continuity of agricultural land uses and activities within a property or a potential rural historic landscape. As outlined in the NPS guidance, rural historic landscapes are defined as a "geographic area that . . . possesses a significant concentration, linkage, or continuity of areas of land use" (National Park Service). This section also addresses awareness of elements that can affect the historic integrity of agricultural properties or landscapes.

When driving to and through a potential rural historic landscape and individual properties, the historian should drive the project length in both directions (if possible) and look for signs of integrity loss before determining if there is continuity of agricultural land use. Certain elements of properties are easier to see when traveling in one direction, but are not necessarily as visible when traveling in the other direction. The historian should drive as

many public roads within an area as possible when assessing continuity and integrity of a potential rural historic landscape.

It should be noted that a layering or variety of agricultural land uses, including farming, ranching, and dairying, within one property or within a landscape may represent continuity of land use, particularly if some or all the activities were conducted during the period of significance. Continuity of land use within an individual property and/or a potential landscape can be seen if extant historic-age resources and landscape elements illustrate agricultural land uses during the period of significance. The types of activities that may disrupt the continuity of agricultural land uses include non-agricultural industrial, light industrial, commercial, and suburban residential development. These activities are often incompatible with agricultural pursuits and can significantly change the character of the area.

Since feeling and other intangible attributes of an individual agricultural property and/or a historic rural landscape can affect their ability to convey significance and a sense of cohesiveness, this fieldwork methodology cannot define the potential programmatic thresholds that would cause an area to lose continuity and integrity. However, this fieldwork methodology can provide guidance for documenting intrusions in an agricultural setting that historians should consider when assessing the integrity of design, setting, materials, workmanship, feeling, and (possibly) association within an individual property or landscape at a later stage of a reconnaissance- or intensive-level survey. These intrusions may include:

- Out-of-scale non-historic-age buildings and/or a disproportionate amount of non-historic-age resources on agricultural properties
- Non-historic-age, non-agricultural industrial, light industrial, commercial, and/or residential development
- Infrastructure facilities such as dams, power plants, and mass-transit facilities
- Transmission lines
- Pipeline corridors
- New and/or large highway facilities

The sense of cohesion and retention of integrity will greatly depend upon the historian's perspective. For that reason, intrusions and their impact on the landscape must be adequately noted, documented, and included in the survey report by means of verbal descriptions and photographs. (See Section 6, Evaluation Methods and Guidelines for information about assessing agricultural properties.)



Figure 3-19. Agricultural Complex in Falls County. The metal-clad building is an intrusive element that detracts from the historic character of this agricultural property.



Figure 3-20. Rural Landscape in Guadalupe County. This image shows the visual effect of power transmission lines to an agricultural property near Geronimo, off SH 123. The land continues to be used for crop cultivation, but the introduction of high-power transmission lines disrupts the historic character of the landscape and diminishes the area's ability to convey a sense of the past.

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Figure 3-21. Rural Landscape in Comal County. The transmission line and cleared corridor that cut a straight and distinct path through southeastern Comal County detract from the area's historic character.

When embarking on surveys of agricultural properties, the historian is encouraged to observe the area, properties, and landscape prior to beginning documentation. This will help the historian gain a better understanding of what should be documented. Table 3-1 below provides a summary of the information presented above and a list of questions that should be asked prior to completing Documentation (Step 2) of the Fieldwork Task.

Table 3-1. Questions to ask when “reading” the landscape.

Questions	Guidance on how to answer questions
1. What are the important historical themes and associated periods of significance for the survey area, and do they overlap?	Determining historic contexts and associated periods of significance begins with initial literature reviews in the development of the Research Design. It is not unusual for agricultural themes to overlap in the development of an area and, in fact, it is rare that any one agricultural property type will completely dominate the history of the area. Therefore, a historian should anticipate that there will be multiple historical themes and associated periods of significance in rural areas of Central Texas.

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2. Are the important historic themes visible on the landscape? If so, how?	Important historical themes can be represented in buildings, structures, landscape features, work yards, fields/pastures, and fencing. See Section 5, Property Types for more detailed information regarding the types of elements that are found in the functional areas of an agricultural property and how they are associated with, and may possess significance within, the historic context in which they were developed.
3. Are there resources on the agricultural properties that were constructed within the periods of significance?	Ascertaining the age of agricultural properties can sometimes be problematic, particularly because farmers and ranchers often will reuse and recycle materials from older outbuildings or construct new buildings using some old materials (e.g., roofing and siding). Comparison of historic aerial photography and maps with current aerial photography and maps may assist in ascertaining construction dates of the resources. Local informants, especially property owners, can also assist in this endeavor. See the Pre-Fieldwork Task in this chapter for an expanded discussion of determining dates of construction of agricultural properties and the elements located therein.
4. In general, what are the individual components of the agricultural landscape, such as vegetation, buildings, outbuildings, and fencing, that should be associated with the historic contexts of the survey area, and are they present in the survey area?	Historic contexts are often best developed by determining the agricultural activities that have occurred within a project area. The historic context will identify the major themes, patterns, and events that have influenced agricultural development within an area and how the buildings, structures, and landscape are physical and tangible links to these trends. The specific kinds of resources and features on any property are explored more fully in Section 5, Property Types.

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<p>5. What intrusive, non-historic-age elements or large non-agricultural-related elements are present in the survey area, and do they affect agricultural properties and the broader landscape?</p>	<p>Identify the elements that interrupt the continuity of use, age, and/or character of the survey area. Look for intrusive elements such as large non-historic-age buildings and/or a disproportionate amount of non-historic-age resources on agricultural properties; non-historic-age non-agricultural industrial, light industrial, commercial, and/or residential development; infrastructure facilities; transmission lines; pipeline corridors; new and/or large highway facilities; and cell phone towers.</p> <p>To assess whether these features impact an individual agricultural property or landscape, the historian should consider the proximity, materials, scale, and proportions of these intrusive features relative to the agricultural property. The historian should also consider the combined effect these non-historic elements impose on a historic agricultural property and the degree to which these intrusive elements collectively detract from or diminish the property's historic character. Regardless of the level of intrusiveness, the historian should be prepared to justify any argument regarding the effect such changes have to an individual property or to the overall landscape.</p>
<p>6. What social, fraternal, or religious institutions; agricultural processing facilities; and transportation networks (roads and railroads), are located in and/or near the survey area? What do they reveal about agricultural patterns in the area?</p>	<p>Review historic and current topographic maps, road maps, and aerial photographs to determine where concentrations of organizing institutions may be and where the circulation networks are. When in the field, determine if such resources and transportation networks are still extant, and determine through on-site research and talking to local informants how important those institutions and circulation networks are to the surrounding agricultural community.</p>
<p>7. What ethnic groups settled in the survey area? When did they come and how did they influence agricultural patterns, architectural traditions, and the landscape over time?</p>	<p>During the development of the Research Design, as well as for the pre-field and on-site research tasks of a survey, the historian should learn what ethnic groups settled in and/or subsequently populated the survey area. OTHMs, types and stylistic influences of churches, vernacular or popular building traditions of houses and/or other substantial buildings, schools, and cemeteries can often point to certain ethnic groups that settled an area. See the rest of this section, Fieldwork Task, for further discussion on this topic.</p>

Step 2: Documentation

After the historian examines the landscape during fieldwork as outlined in Step 1, the historian should document the properties and the landscape. This section is divided into two main scenarios: 1) ROE has been obtained, and 2) ROE is not obtained or is denied. It should be noted that documentation must first begin with a careful review of field maps and a systematic approach to looking at **EVERY** parcel located within the APE. As mentioned above, this is best accomplished by having an up-to-date aerial map as the base for the field maps. The historian should review the aerials thoroughly while completing fieldwork, and be sure that the aerial photographs (along with what is seen on the landscape) guide the documentation efforts in the field. For this reason, it is often helpful to have two people conducting fieldwork – one person to drive and one person who can examine the aerial photographs for resources on parcels within or partially within the APE.

- **ROE Obtained**

First, when ROE is obtained, documentation (and reviewing the property) is the most effective and efficient way to complete fieldwork. Documentation is the recordation of what the historian is seeing in the field. This is most often done through photography, verbal descriptions, mapping individual resources on properties, and (if needed) sketch maps. These are described below:

Photography is an essential part of historic resources surveys. TxDOT has specific photographic requirements in the SOUs for reconnaissance- and intensive-level surveys, and historians should review those requirements prior to completing field investigations. It is imperative to have a well-documented photo log to keep track of photographs since properties and elements of resources are often similar in appearance within a particular location.

Verbal descriptions should also be part of documenting resources. This is particularly important when limited visibility due to vegetation or other elements obstructs the view of resources. As noted in TxDOT's SOUs, verbal descriptions are required for resources that cannot be clearly photographed. Verbal descriptions also aid in the description of the resources when the historian is writing the HRSR, and can provide vital details for proper evaluation.

Mapping of resources is also part of the documentation process, and must be combined with photography and verbal descriptions. Labeling a field map with the exact location of each resource while on a property greatly reduces the chance of having errors when it comes time to map the resources for the HRSR.

A sketch plan is another way to document resources. While helpful at the reconnaissance level, a sketch plan of an individual property is a critical step that should be undertaken during field investigations for an intensive-level survey. The sketch map should include an

overall layout of the property that shows the approximate location of resources, yards, fields/pastures, other landscape features, internal circulation networks, and a north arrow.

On an agricultural property, which often has several resources, photographing must be undertaken using a two-pronged approach: documenting individual resources on the property and documenting the relationship between the resources and the three functional areas. While TxDOT's SOUs for completing non-archeological historic resources reconnaissance- and intensive-level surveys should be strictly followed, this guidance provides additional suggestions for documenting individual resources on agricultural properties. The list below outlines the resources that historians should document as part of a survey of agricultural properties:

- **Gates and other entrances**

Photograph the main entrance gate to the property and key its location to a map.

Photograph the main entrance to the property in relation to the rest of the property.

Photograph the main entrance to the property in relation to the roadway where work is proposed.

Photograph any other primary entrances to the property and key them to a map.

Describe the gates in field notes.

- **Buildings**

Photograph the main house and any other houses on the property from multiple angles (including the front elevation) and any architectural details that demonstrate the house's style. Key the house's location to a map and write a detailed description of the house.

If a large barn exists or other prominent outbuilding on the property is extant, photograph the building from multiple angles and photograph any elements that are indicative of a particular architectural design. Key the location of the barn or other prominent outbuilding to a map and write a detailed description of the building.

Photograph the primary façade (at a minimum) of any other buildings on the property, key them to a map, and write a detailed description of each building.

For illustrations of common types of buildings that may be found on agricultural properties, see Section 5, Property Type Development.

- **Structures**

Photograph the primary façade (at a minimum) of each structure on the property, key it to a map, and write a detailed description of each structure. For illustrations of common types of structures that may be found on agricultural properties, see Section 5, Property Type Development.

- **Circulation networks**

Photograph driveways and paths through the property.

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Write a detailed description of what features the driveways and paths are connecting on the property.

- **Fields/pastures**

Photograph the fields and pastures on the property.

Write a detailed description of the fields and pastures on the property. Note if the fields are fallow or planted.

- **Fences**

Photograph the fences found throughout the property and key different fence types to a map. Note that some fencing may be different near the main entrance. For illustrations of common fence types found on agricultural properties, see Section 5, Property Type Development.

Write a detailed description of the different fence types found on the property.

- **Other landscape features**

Photograph other landscape features on the property, which are resources such as dipping vats, irrigation features, contouring, and plantings. These features are part of the landscape and should be photographed, keyed to a map, and described just like other individual resources on the property.

The historian should also document the relationships among resources, functional areas, and the roadway. Remember to stand far enough away from the resources to get an overall perspective of the relationships within the property. To adequately record these relationships, the historian should document:

- **Domestic work zone**

Photograph the domestic work zone and show as many of the resources within the domestic work zone as possible.

Write a detailed description of the relationship among the resources and complete a sketch map of the domestic work zone.

- **Agricultural work zone**

Photograph the agricultural work zone and show as many of the resources within the agricultural work zone as possible.

Write a detailed description of the relationship among the resources and complete a sketch map of the agricultural work zone.

- **Relationships among the domestic work zone, agricultural work zone, and the fields/pastures**

Photograph the relationship between the work zones and the fields/pastures.

Photograph the relationship between the roadway and the work zones and the fields/pastures.

- **Relationships among historic-age and non-historic-age resources, and other intrusive elements on the landscape**

Photograph the relationships among the historic-age and non-historic-age resources to demonstrate if the non-historic-age resources result in a loss of integrity.

Photograph intrusive elements on the landscape that affect the property's historic integrity of design, setting, materials, workmanship, feeling, and/or association (pipelines, towers, etc.) as noted above.

- **Relationships among the existing/proposed ROW and the closest resources**

Photograph the relationship between the existing/proposed ROW and/or easements and the resources that are closest to the existing/proposed ROW and/or easements. This can be accomplished by facing the road and the resources, and ensuring that the road is visible in the photograph. It can also be accomplished by taking a photograph parallel to the roadway and showing the road on one side of the photograph and the resources on the other side of the photograph.

The historian should also document whether a potential rural historic landscape is located within or partially within the project's APE. This is best done on locations that are slightly higher in elevation and provide vantage points where photographs can be taken. Primarily, documentation efforts of landscape features include photography of the following elements:

- Overall views of buildings, structures, landscape features, and fields/pastures of individual and multiple properties (if possible)
- Vistas that show land use and topography associated with multiple properties
- Relationships among the roadways, rivers, and/or railroads
- Intrusive elements that affect the overall historic integrity of design, setting, materials, workmanship, feeling, and/or association (transmission lines, utility rights-of-way, etc.) within the area



Figure 3-22. Oblique View of the Original Residence on an Agricultural Property. Note that the residence fills most of the frame, as required by TxDOT SOUs. Further documentation of the residence should include multiple elevations and its relationship to other standing structures and zones on the property.



Figure 3-23. Detail View of a Stone Entrance Gate. The historian should also describe the gate in the field notes to be included later in the survey report.



Figure 3-24. Contextual View of Spatial Distances Between Features on a Property and How the Property Has Changed Over Time. The abandoned house to the right may have been the original residence on the property, contained within the original domestic work zone that is now uncultivated pasture. The current domestic work zone is located in the background to the left and includes a newer residence and shed.



Figure 3-25. View of Spatial Relationships between the Agricultural Work Zone and the Existing Road. This is an important aspect to document in order to assess potential effects to the property.

- **ROE Denied or Not Obtained**

If ROE is not obtained or is denied, the historian must not ignore the property. Instead, the standard fieldwork methodology must be altered to adapt to such a situation. If access to the property is not possible or not permitted, the historian should document any elements that are visible from the existing ROW, including but not limited to the front entrance gate and any portion of buildings, structures, windmills, fields, fences, and other landscape features that are visible. The historian should photograph any other elements of the property that add to a better understanding of the types of agricultural activities that are occurring on the property. To supplement information that could not be obtained through visual inspection and documentation of the property, comparison of historic and current maps and aerial photography is necessary after fieldwork is completed. (See Step 2 of the Post-Fieldwork Task.)

Step 3: On-Site Research

On-site research should be a two-fold process: talking to local informants and completing research at repositories near the project site. As noted in Step 4 of the Pre-Fieldwork Task, talking to local residents can be greatly beneficial to understanding the history and potential significance of agricultural properties. Local informants may be particularly helpful in identifying, understanding, documenting, and evaluating agricultural properties in a local context. The people who should be contacted include property owners, librarians, local historians, members of the county historical commission and preservation groups, and, if applicable, representatives of certified local governments and employees of government agencies such as the SCS. Please refer back to Step 4 of the Pre-Fieldwork Task for a list of questions that the historian should ask that will aid in eliciting information from local informants.

Conducting research at local repositories is the other essential part of on-site research. Preparation for completing on-site research (including finding sources and talking to local historians and librarians) was discussed in Step 4 of the Pre-Fieldwork Task. The following discussion describes how to complete research at on-site repositories. The repositories that commonly provide the most helpful information include:

- CAD offices
- County and city libraries
- Local university or college libraries
- Local historical society offices and/or local museums
- Courthouses (county and district clerks, and tax assessor/collector offices)

If CAD information is not available online, going to the local CAD office should be the first on-site repository that a historian visits. The CAD offices have maps with the parcel lines delineated, property owners' names, and often time references to deeds associated with the property in the last few years. At the CAD office, the historian simply shows the staff a map of what property (or properties) they are surveying and researching, and the staff will look up the current property information for them or

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provide the historian instructions on how to find the information themselves at the office. As noted above, however, if this information is available online, a visit to the CAD office may not be necessary.

County and city libraries, local university libraries, and local historical societies are the primary locations for on-site research. For reconnaissance-level surveys, conducting on-site research at these local repositories is vital in presenting a more fully developed historic context, as local libraries often have publications that are not available in regional or state repositories, such as TSLAC and CAH. Historians should review local histories, county histories, and family histories to gain an understanding of the area's history. Additionally, the historian should review the list of property owners obtained from the CAD, review the names of the farms or ranches observed during fieldwork (if the properties are named), and determine if any of the property owners or properties themselves are mentioned as significant within the area. The historian should ask the librarian or archivist for access to historic photographs, maps, or aerial photographs of the project area, because these can provide vital insight into the history of an area. For intensive-level surveys, historians may consider searching local newspapers, which are often on micro-film at local libraries. Unless the records are indexed and the historian is looking for a specific event, such an endeavor can be daunting and time-consuming. If a historian is considering newspaper research on micro-film, it is recommended that such activities be outlined in the Research Design and approved by TxDOT. For more information about talking to local librarians about their collections, see Step 4 in the Pre-Fieldwork Task. For more information about these local repositories and the types of resources included therein, please see Section 2, Research Guide and Methodology.

County courthouses are another repository where the historian may conduct research during on-site research, particularly when the historian is completing property-specific research. Specifically, researching deeds and creating a chain of title for a property is often completed at county courthouses. By using the information for the current property owner obtained from the CAD (including a reference to the most recent deed transaction, if available), the historian can begin the chain of title. Completing a chain of title is accomplished by reading each warranty deed and finding the reference to the previous owner. In some cases, the deed will include references to earlier transactions, including deed volumes and pages. After the chain of title is complete, the historian will have the full set of property owners' names, descriptions of property as it changed over time, and its relationship to earlier, larger associated tracts.

It is important to note that the historian should undertake on-site research at a time that is most advantageous for the surveyor, and the process should be organic. This may mean that a historian needs to gather more information at local repositories and talk to local informants before conducting fieldwork to help understand the types of historic-age resources to be documented within the project's APE. In other cases, the historian may want to see the historic-age resources first before going to local libraries and/or talking to informants to help focus their on-site research. Whatever the case, the timing is not as important as completing the research and soliciting information from local residents and property owners sometime while traveling to the project site.

Step 4: Preliminary Eligibility Assessment

Following fieldwork, the historian should evaluate information and documentation gathered during the fieldwork phase and should begin to ascertain preliminary NRHP-eligibility assessments. (See Section 6, NRHP Evaluation Methods and Guidelines for discussions regarding NRHP eligibility.) With the benefit of having completed all fieldwork, the historian should reconsider initial perceptions and assessments made in the field. For example, a resource that was documented during the early stages of the field investigations might initially seem to be a particularly good example of a type or method of construction; however, subsequent work may show that the building is actually a common form or that better and more intact examples may exist elsewhere within the survey area. Historians should consider possibilities for NRHP eligibility based on their observations of the project area, their review of historic and current maps and aerial photography, their pre-fieldwork research, and their on-site research. If more on-site research is necessary to make a preliminary evaluation, the historian may want to complete that work, if possible.

POST-FIELDWORK TASK

This section of the report outlines the best practices and guidance for completing post-fieldwork activities. Many of these activities are universal and not specific to agricultural properties, but they are important to remember when completing reconnaissance- and intensive-level surveys of agricultural properties and potential rural historic landscapes. The Post-Fieldwork Task includes the following four steps:

Step 1: Manage documentation and field records for immediate and future reference and use.

Step 2: Compile and synthesize the information gathered during pre-fieldwork activities, field investigations of properties and potential landscapes, and on-site research.

Step 3: Follow up with local informants, if needed.

Step 4: Discuss potential significance with colleagues.

Step 1: Manage Documentation and Field Records

Historians should maintain organized and comprehensive field materials, which can help avoid confusion, increase efficiency, and prevent losing photographs and/or notes as well as mis-characterization and mis-mapping of elements on agricultural properties and within landscapes. Best practices for management of field materials begin in the field. While completing fieldwork, it is recommended that historians download their photographs from their digital cameras to a laptop computer every day and review the photographs taken that day. For day trips, completing this exercise before leaving the project area will allow the historian to look at the photographs on a computer screen to review photographic details. In doing so, the historian can determine if the photographs satisfactorily show what needs to be documented on a particular property and within a potential rural historic landscape. If photographs need to be retaken or additional photographs are required, they can be taken while still at the project site. For multiple-day trips, it is highly recommended to save and review digital photographs every evening for these reasons and to avoid the loss of the photographs (through

accidental deletion, malfunction of the memory card, or theft). Since going back to the field is often expensive and may require additional coordination with property owners, saving photographs to and reviewing photographs on a laptop every day is a recommended practice to ensure that photographic documentation is complete and satisfactory.

After returning from the field, the historian should scan fieldwork materials and provide the field maps to the GIS staff. Scanning the photo log and site sketch as a pdf and saving those files with the photographs will help to ensure that the vital field materials are kept together. Scanning notes from local informant interviews (with the informants' names and dates of communications) should also be completed so the information can be included in the survey report and verified, if necessary. Providing field maps to GIS staff must be done after fieldwork is completed, and resource numbers on the field maps should match resource numbers in the photo log. After completion of mapping the inventoried resources, field maps should be retained with the survey materials if information must be verified, or if an intensive-level survey is required following a reconnaissance-level survey.

Step 2: Compile and Synthesize Information

A vital part of the Post-Fieldwork Task is compiling and synthesizing the information gathered during pre-fieldwork activities, field investigations, and on-site research. This requires reviewing materials that were gathered during the Pre-Fieldwork Task, including comparing the historic and current maps and aerial photographs. In reconnaissance- and intensive-level surveys, the historian must attempt to combine information gathered from pre-fieldwork and fieldwork activities to create a cohesive and understandable history of the area, along with appropriate registration requirements and evaluations of NRHP eligibility. Part of the compilation of materials, particularly for intensive-level surveys, is seeking appropriate evaluation methodologies for similar agricultural properties and/or landscapes, which may be found in NRHP nominations and/or other states' historic contexts and studies. The purpose of this task is to pull together all the resources and materials gathered to date and assimilate them with what was seen in the field.

If ROE was not obtained or was denied, the compilation and synthesis step will have the added component of reviewing historic and current aerial photographs and maps to help supplement information regarding the properties. Current aerial photographs available from Bing (<http://www.bing.com/>) or Google Earth (<http://www.google.com/earth/>) can provide extensive coverage of low-flown aerial photography that allows the historian to see buildings, structures, yards, and fields/pastures. In doing so, the historian may be able to see enough detail to assess the potential significance of a property, as well as evaluate some (if not all) aspects of its historic integrity. Overlay of historic aerial photographs and maps atop current aerial photographs can also illustrate how a property has changed over time, if elements are extant, and/or if intrusive non-historic elements detract from the property's integrity and historic character. Together with the photographs taken from the existing ROW, these maps and aerial photographs should be incorporated into the survey report and included as documentation for agricultural properties.

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This approach of reviewing historic maps and aerial photography is only appropriate when ROE is not obtained or was denied. Historians should not rely on this methodology as the sole approach to completing a survey. Rather, using aerial and map analysis should be used in conjunction with documentation efforts completed while at the project site. Furthermore, it should be noted that if ROE is not obtained for a reconnaissance-level survey, the aerial and map analysis described here may be used to determine if further investigations (such as an intensive-level survey) may be necessary.

Step 3: Follow-Up with Local Informants

Once the compilation of information is completed in Step 2, historians should determine if follow-up or additional communication is required with local informants. As previously noted, seeking assistance from County Extension Agents, CHC coordinators, local historians, librarians, and property owners can occur at any time before, during, and after fieldwork. This step is included in the post-fieldwork activities to remind the historian to seek out local informants after the compilation of information, if needed.

Step 4: Discuss with Colleagues

Agricultural properties and rural historic landscapes are complex resources with layered histories and various development periods. As a result, it is recommended that historians completing a reconnaissance- or intensive-level survey of agricultural properties and potential historic districts discuss potential significance, integrity considerations, and field observations with colleagues. Since these investigations can often be subjective, from boundary demarcations for survey areas to determining the uses of resources located in the survey area, discussing the properties and potential rural historic landscape from several different angles will enable the historian to formulate justifications and arguments in the survey report.

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- 1999 Guidelines for Evaluating and Documenting Rural Historic Landscapes. U.S. Department of the Interior, Washington, D.C.

SECTION 4. HISTORIC CONTEXT

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INTRODUCTION

Agricultural Theme Study for Central Texas: A Context for Understanding the History of Agriculture in Central Texas, 1700–Current, is comprised of four sections: Agriculture in Texas and the 13-county study area within a National Context, 1700–Current; Farming in Central Texas, Pre-1870–Current; Ranching in Central Texas, 1718–Current; and Dairying in Central Texas, 1867–Current. The first section summarizes the history of agriculture in the United States, in Texas, and in the study area by examining eight major topics:

- Economic cycles
- Government programs and policies
- Weather
- Crops and livestock
- Agricultural machinery and technology
- Transportation
- Farm organizations and movements
- Agricultural information, education, and extension work.

Within the first section, information about the topics is divided into development periods. Within each development period, there are discussions, first about agriculture in the United States, then about agriculture in Texas, and finally about agriculture in the study area. Specific information about each of the eight topics also appears in chronological order in *Table 4-1* and provides the basis for the first section of this report.

The remaining three sections focus on three major agricultural activities within the 13-county study area—farming, ranching, and dairying—and identify developmental periods associated with each activity. Linking agricultural activities with national state trends discussed in the first section, the subsequent three sections provide the histories of each activity and, where appropriate, also link each one with contemporaneous trends associated with the other activities. The sections describe the significant themes, events, and historic patterns that have influenced the physical evolution of farms, ranches, and dairies as agricultural types. These developmental periods are not to be considered as periods of significance. Instead, they correspond to events, trends, and patterns outside of and within the study area, and they reflect cultural landscape patterns and architecture that are directly linked to each activity.¹ For that reason, the chronological periods identified for each frequently are different. Economic cycles, markets, legislation, and technology and machinery, among other factors, have impacted categories of agricultural activities differently.

The study area is comprised of 13 counties (from south to north, Bexar, Comal, Guadalupe, Hays, Caldwell, Bastrop, Travis, Williamson, Bell, Coryell, Milam, Falls, and McLennan). The area is

¹ A more complete discussion of the physical evolution of farms, ranches, and dairies within the context of significant themes, events, and historic periods appears in Section 5, Property Types.

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agriculturally rich and physiographically complex because it encompasses two distinctive regions on either side of the Balcones Escarpment. The Escarpment is a geographical divide that has strongly influenced much of the agricultural history and built landscape in Central Texas. It is a cliff-like ridge formed by the Balcones Fault that runs in a general north/south direction in the vicinity of the present-day Interstate Highway (IH) 35 corridor.

East of the escarpment are rolling hills with soils that are generally characterized as Blackland Prairie. Several rivers bisect the Blackland Prairie in a northwest/southeast orientation; they include the Brazos, Colorado, San Marcos, Guadalupe, and San Antonio rivers. Because of the plentiful surface water and soil resources available in the Blackland Prairie region, it attracted settlement as early as the eighteenth century and proved adaptable to a wide range of agricultural activities. West of the Balcones Escarpment is a combination of generally thinner, rockier soils located on steeper hillsides, and alluvial soils found in stream valleys and terraces. The relative paucity of deep soils and surface water resulted in settlement that occurred later than that on the Blackland Prairie; it has made the area increasingly less appropriate for farming and more appropriate for ranching.

Despite fundamental environmental differences in the two sub-regions of the study area, farming, ranching, and dairying have been practiced there for an extended period of time as agriculturists have responded to changes in markets, government programs, the availability of a transportation infrastructure, development of agricultural machinery and other equipment, growth of urban centers, and dramatic weather events such as droughts and floods. One result of the interaction among the three activities and these often-external factors has been a layering of history that is reflected in the cultural landscape. This characteristic layering underscores the dynamic character of agricultural practice and history as farmers, ranchers, and dairymen have responded resourcefully to the challenges of agriculture in Central Texas.

AGRICULTURE IN TEXAS WITHIN A NATIONAL CONTEXT, 1700-1980

INTRODUCTION

Since its beginnings in the early 1700s, agriculture has been a primary economic engine throughout Texas, just as it has been in the United States as a whole. It has been a reason for exploration and settlement, key to railroad and road planning and construction, and a foundation of sustained rural and urban development. Agricultural practices have been variable due to factors that are indigenous to national, regional, and local physiographic regions, including soils, availability of surface and ground water, and differences in climate. The development of inventions and information has helped mitigate problems presented by natural elements and has contributed to a trajectory that has shifted the practice of agriculture from subsistence to industrial throughout the United States during the past three centuries.

AGRICULTURE IN THE EIGHTEENTH CENTURY

UNITED STATES

European-based agricultural practices had their beginnings in North America in the East Coast region by the early seventeenth century, when it was an individual or colony activity. On the East Coast, local governments sometimes regulated food prices. By the late eighteenth century, the federal government had created a patent office, and the idea of a National Board of Agriculture was discussed. Societies for the promotion of agricultural learning had begun to appear in Philadelphia and elsewhere by the last quarter of the eighteenth century.

Crops were cultivated widely on a subsistence level using oxen and horses and were aided by wooden tools and other simple devices. Indeed, it was not until the last decade of the eighteenth century that the East Coast saw the invention of the cotton gin and patenting of a cast iron plow. With the exception of Spanish Florida, livestock raising also was limited in scale on the East Coast. Domesticated livestock included cattle and sheep, the latter being a mainstay of local economies. Crops, livestock, and livestock products typically were moved by water and on trails, some of which extended far beyond modern-day state lines.

TEXAS

European-based agriculture in Texas lagged behind that on the East coast region by a century. In addition, Texas agriculture was associated with institutions – the Catholic Church and Spanish government. Agriculture in Texas also was practiced on a large geographic scale and resulted in the superimposition of regular, formal patterns on the land and creation of distinctive landscapes that are recognizable in the twenty-first century.

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By 1716, the Spanish crown had made a grant in East Texas for a mission and presidio. By the mid-eighteenth century in the region of South Texas and straddling the Rio Grande River, formal colonization activities by José de Escandón resulted in distinctive *porciones* that fronted on the river and larger grants of grazing land. These pastures supported herds that expanded almost unchecked. By the last third of the eighteenth century, despite devastating multiyear droughts and at least one record-breaking winter, census takers in just one region of Spanish Texas—the Goliad area of the San Antonio River valley—could enumerate approximately 70,000 cattle and 40,000–50,000 sheep.

The scale of the Texas landscape made it difficult, if not impossible, to organize agriculture in ways that were possible on the East Coast. In addition, outside of information spread by the church, no societies for the promotion of agricultural learning existed in Texas. Finally, the scale of livestock raising in Texas was entirely different from that on the East Coast. By the end of the eighteenth century, the animal population in Texas far surpassed anything remotely imaginable to North American colonists outside of Spanish Florida.

In other ways, however, eighteenth-century agriculture in Texas was similar to other areas in North America: sheep were a mainstay of the economy, outside of the mission system, and crop cultivation was on an individual subsistence level. Crop cultivation and animal care were labor-intensive and involved the use of animals and primitive tools.

STUDY AREA

By the mid-eighteenth century, the Catholic Church had established short-lived missions in present-day Milam, Travis, Hays, and Comal Counties. The Church and Spanish Crown also had established a presidio and the first of six missions, five of which were successful, in Bexar County near the San Antonio River. Associated mission communities, which were largely self-supporting, developed extensive irrigation systems (*acequias*) that watered farmland and provided power for a mill at Mission San José y San Miguel de Aguayo. Crops included cotton, grains, beans, vegetables, and sugarcane.

The missions also operated ranches, and the Spanish government made extensive livestock grants in the San Antonio River Valley. Owners raised large numbers of cattle, sheep and goats. The missions managed large herds, as well, until the mid-1790s, when they were secularized and their land holdings were distributed to local Spanish settlers and missionized Indians.

AGRICULTURE FROM 1800 THROUGH THE MEXICAN WAR

UNITED STATES

The period between the turn of the eighteenth century and Mexican War of 1846–1848 was marked by a war with England in 1812, national panics, and a major food shortage sparked by the eruption of Mount Tambora in 1815; the eruption led to a year without summer and may have instigated westward migrations from New England. Physical expansion and speculative booms cyclically led to recessions,

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Historic Context

depressions, and even panics between 1815 and 1843. The Panic of 1837 was so severe that it affected areas as far away as Texas, where a scarcity of money negatively affected land and commodity prices. Nonetheless, local and federal governments developed policies and passed laws that were beneficial to agriculture and the formation of agricultural communities. Acknowledging the leading role of agriculture in local and national economies, for example, some states established boards of agriculture and conducted soil surveys. The U.S. House and Senate established agricultural committees, and the Patent Office began to collect and analyze agricultural statistics and then to distribute seeds. Hoping to capitalize on agricultural knowledge in foreign countries, the Secretary of the Treasury instructed consuls to collect seeds, plants, and information about agricultural inventions outside the United States.

Agricultural technology, access to information, and development of transportation systems in the United States flourished during this time. The McCormick reaper, a threshing machine, and a grain drill were patented between 1834 and 1841; John Deere and L. A. Andrus began manufacturing steel plows in 1837; the first grain elevator was erected in Buffalo, New York, in 1842; and the commercial fertilizer industry was founded in 1843. Information about agricultural processes and practices spread through agricultural societies and fairs, and through the publication of periodicals such as *The Agricultural Museum* (1810), *The American Farmer* and *The Plough Boy* (1819), *New England Farmer* (1822), *The New-York Farmer and Horticultural Repository* and *The Southern Agriculturist, and Register of Rural Affairs* (1828), *The Cultivator* (1834), and *The Union Agriculturist and Western Prairie Farmer* (1841). By 1840, approximately 30 farm journals in the United States had a circulation of more than 100,000; many readers were located in Texas. Extension of transportation infrastructure, primarily through canal construction and later railroads (post-1830) and plank roads (post-1845) further stimulated agricultural production and sales, which grew beyond subsistence to commercial levels by the 1840s.

Thanks to the confluence of invention, information, markets, demand, improved transportation, and migration, agriculture in the eastern half of the United States thrived and became increasingly specialized prior to the Mexican War. By 1830, cotton had become the most important cash crop in the South, while wheat cultivation began to concentrate in the Midwest. Interest in livestock focused on Merino sheep, which had been imported to the United States in the eighteenth century, and whose popularity swept the country after 1815. In addition, importation of purebred meat and dairy cattle, including the Hereford, Ayrshire, Calloway, Jersey, and Holstein breeds, fundamentally changed the livestock industry.

TEXAS

By contrast, Texas between the secularization of the San Antonio missions in 1794 and Mexican War of 1846–1848 was largely chaotic and agriculturally disorganized. Torn by revolution in the opening decades of the nineteenth century, isolated from centers of Spanish and then Mexican government, and hampered by the lack of a substantial population of agriculturists, the region's productivity suffered until the Spanish government opened Texas to regularized foreign immigration in 1820. Newly independent Mexico passed colonization laws in 1823 and 1825 that were beneficial to farmers and stock raisers in present-day Texas. After 1835, the Republic of Texas guaranteed Texans their slave

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property, continued liberal land grant practices, and passed the first of several pre-emption acts that encouraged actual settlement. In the area of transportation, the Republic of Texas proposed a number of internal improvements, including plank roads, canals, and railroads.

In other areas supportive of agricultural enterprise, Texas residents lagged. By the 1830s, farmers could access information available in a variety of U.S.-published farm journals such as *The Southern Agriculturist*, and the few local newspapers frequently included agriculture-related articles. In addition, more-prosperous farmers often sent their sons east to private boarding schools and colleges, where they kept abreast of new practices in farming and sometimes returned with equipment and useful knowledge. But access to new inventions was limited and, in the cash-poor Texas society, there was little ability to purchase manufactured tools and equipment until the 1840s. Sugar and cotton production, much of it in Austin's Colony along the lower Brazos and Colorado rivers, involved the use of horses for power, wooden rollers to crush cane, plantation-constructed gins, and corn and grist mills.

With transportation limited to river travel and unimproved, localized roads, however, crop production on a scale becoming increasingly common in the South and Midwest was beyond the grasp of Texas farmers for much of the early nineteenth century. The cotton crop of 25,879 bales in 1844–1845 had increased almost fourfold from 6,970 bales in 1839–1840. But it still was only several thousand more than Georgia had produced in 1801.

Stock raising and marketing, on the other hand, flourished. The Merino sheep that had been so popular in the United States in the early 1800s, as well as Saxon sheep, were brought to Texas to improve the native Mexican *chaurro* stock throughout the eastern half of the state. Cattle flourished, and by the 1840s they were plentiful, in high demand, and relatively easy to deliver to markets. Production areas expanded, and cattle raising intensified.

STUDY AREA

As in the rest of Texas, settlement and the practice of agriculture in the study area during the first half of the nineteenth century was limited, disorganized, local, and hampered by a lack of transportation infrastructure. Revolution by citizens of Bexar against the Spanish government in 1811 kept the study area unsettled for decades, as did the Revolution of 1836 and Mexican War of 1846-1848.

During the first decade of the nineteenth century, San Antonio served as the capital of Texas and an important shipping point for landholders who raised large numbers of livestock and exported them to Coahuila and Louisiana. The attractiveness of the region, with its plentiful water sources and fertile soils encouraged individuals to seek land grants on the Guadalupe and San Marcos Rivers in 1806-1807 and at major springs in 1825. However, settlement remained short-lived or was postponed for decades.

Actual colonization in the study area outside of present-day Bexar County was delayed until the late 1820s. At that time, present-day Guadalupe and Caldwell Counties became parts of DeWitt's Colony; Travis and Bastrop Counties became parts of Stephen F. Austin's Third, or "Little," Colony; and

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Williamson, Milam, Bell, Coryell, Falls, and McLennan Counties became parts of Leftwich's or Robertson's Colony. Within those three large colony grants, settlement occurred only sporadically.

The most intensive settlement in the late 1820s and 1830s occurred along the Colorado River near Bastrop, where slaves were introduced and cotton-growing plantations were established. In the balance of the study area, settlement remained unstable, due largely to Indian raids and political events. Not until the mid-1840s was there a degree of stability that encouraged reoccupation and new immigration. German migrants moved to the area around springs in Comal County and to the northern and western parts of Guadalupe County. A peace treaty with Indian tribes in the northern part of the study area encouraged permanent settlement in present-day McLennan County, and construction of Fort Gates in 1849 induced reoccupation of parts of Robertson's Colony.

The impact of geographical isolation, political unrest, war, and hostile Indians on agriculture in the study area was significant and ongoing. Lacking security and forced to leave their agricultural holdings on a sporadic basis, sometime-residents would have found commercial-scale raising of crops impossible even though areas along major rivers and creeks and in the vicinity of springs were favorable to farming. An exception would have been in areas proximate to San Antonio, where the United States government established a major quartermaster depot. The depot supplied troop operations during the Mexican War and would have encouraged crop production. As a result, farming remained at a subsistence level throughout the 13-county area.

While farming in the study area suffered from a variety of factors, stock raising continued to be characterized by the large-scale production of the eighteenth century. Livestock herds increased, and individuals who self-identified as stock raisers emerged. Typical of that category would have been Michael Erskine, who purchased the 1806 El Capote Spanish grant in Guadalupe County and developed a ranch and large herds beginning in the early 1840s. Around that time, cattle herds moved up the Shawnee Trail through the study area and on to Missouri, and in 1846 one stock raiser drove 1,000 head of cattle from Texas to Ohio. In the nascent German settlements of Comal and Guadalupe Counties, German immigrants bred Saxon sheep with *chauros*, successfully improving the native stock and laying the foundation for the subsequent tremendous growth that the sheep industry experienced in the study area.

AGRICULTURE FROM 1848 TO 1865

UNITED STATES

The period from 1848 to 1865 saw the end of war with Mexico, activity by the federal government to incorporate a large land mass from Texas to California, and involvement in the Civil War that resulted in more than 600,000 people dead. In the space of two decades that were defined by expansion and war, the United States now embraced a new state—Texas—and enjoyed considerable economic expansion. During the 1850s, major rail lines extended from growing urban centers on the East Coast across the Appalachian Mountains, and by 1860, the country could boast of 30,000 miles of railroad track. Steam

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and clipper ship numbers increased and improved the transportation of all kinds of U.S.-produced goods to Europe, including agricultural products such as cotton.

Agricultural enterprise continued its westward expansion as the Corn Belt stabilized in the Midwest, a wheat belt began developing on the plains, and cotton cultivation and slave populations moved steadily west. Localized demand for agricultural commodities increased in the western United States after the federal government established new army posts following the Mexican War. For more than a decade, the War Department injected cash into local and regional economies through its numerous forts, camps, and depots.

Agricultural practice and increased production were aided by a number of new inventions and increasingly accessible technology, including chemical fertilizers (1849), self-governing windmills (1854), and the two-horse straddle-row cultivator (1856). Gang plows and sulky plows were commonly used at the close of the Civil War. Newer methods of food preservation such as Mason jars (1858) and Gail Borden's condensing process for milk, fruit juices, beef, and coffee (1850s) extended the life and utility of basic foodstuffs.

Non-government and government initiatives also contributed to agricultural success in the United States. Education and mutual support within agricultural communities proliferated with the spread of cooperatives, clubs, and societies, and by 1860, there were 941 agricultural societies in the United States. The U.S. Department of Agriculture was established in 1862, and the same year, Congress passed the Morrill Land Grant College Act. The Act provided a mechanism for states to fund colleges whose purpose was to teach agriculture and the mechanical arts.

TEXAS

The seventeen years between the end of the Mexican War and Civil War in Texas were marked by remarkable economic growth, despite impediments to immigration and agriculture caused by a record freeze in 1855 that destroyed wheat crops in Central Texas, and a decade-long drought that ruined crops and decimated livestock herds. The drought, which reached record proportions by the late 1850s, also worsened Native American–European American relations and left some residents questioning the agricultural viability of the region.

Counter influences included the new presence of federal troops at more than two dozen major military installations, all of which pumped cash into a nearly cashless society at a record rate as the Army's Department of Texas purchased goods, services, and agricultural commodities throughout the state. Large numbers of slave holders and slaves migrated from states in the Deep South, pushing the cotton belt steadily west. Texas's slave population in 1850 (58,161) more than tripled by 1860 (182,566).

Improved transportation also aided in the agricultural and economic development of the state. Movement within Texas and links to trade centers beyond its borders were facilitated by the continued development of trade routes and a commitment by the state to offer land in payment for railroad

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construction encouraged connectivity. By 1861, Texas had nine railroad companies and 470 miles of track. Along the coast, work continued on extension of the intercoastal canal. During the Civil War, the canal aided the shipment of Texas-grown cotton, despite a Union embargo that effectively shut down trade from the state's major ports.

Industrial development associated with crop and livestock raising grew as well. The volume of cotton production, which increased from 58,072 bales in 1849–1850 to 431,645 bales in 1859, encouraged construction of manufacturing facilities such as oil mills and gins. The large rate of wheat cultivation beginning in the late 1840s made flour and grist milling a major industry, despite a ruinous freeze in 1855. In 1859, for example, C. H. Guenther built a flour mill in San Antonio, the trade center for a region that was becoming known for its grain cultivation.

The same decade and a half was an outstanding one for livestock breeding, raising, and marketing in Texas, to a great extent because of the expansion of the territory available to stockmen. By the Civil War, cattle raising was centered in the eastern half of the state. But a sustained federal military presence in the western half of the state also facilitated production on the eastern Rolling Plains and eastern Edwards Plateau, and in Central Texas. Starting from Hays County, outbreaks of cattle fever along the route north of Texas eventually led to quarantines in other states and forced Texas cattlemen to turn their herds west along the San Antonio to El Paso corridor and on to California. Nevertheless, Texas was by far the leading state in cattle production by 1860, and while the cattle industry suffered during the Civil War due to closing of federal forts and lessening of demand for beef, the herds continued to increase.

In addition, Texas saw increased importations of improved sheep and goat breeds. Wool production grew, not only because of the increasing numbers of animals raised within Texas and the introduction of herds driven into the state from the Midwest and Ohio Valley, but also because of the continued improvements experienced by breeding blooded stock with native sheep. Angora goats also were imported from the U.S. South in the 1850s, and the value of their mohair soon became apparent.

STUDY AREA

Agriculture after the Mexican War and until the end of the Civil War developed strongly, if unevenly, across the study area. Small farm units remained the norm, and cattle and sheep continued to dominate the agricultural economy throughout the region. But production of corn increased significantly, and the promise of cotton as a commercial crop in some counties east of the Balcones Escarpment was evident.

Several factors threatened to undercut agricultural success during the decade and a half. First was a persistent lack of transportation infrastructure such as railroads, rivers that accommodated commercial-level shipping as far inland as Central Texas, and the absence of road infrastructure outside of San Antonio and contiguous areas. Second was a record freeze that destroyed the Central Texas wheat crop and was followed by a two-year drought. That drought was sufficiently severe to result in significant crop and livestock losses and reverse the post-Mexican War trend of immigration to Texas. A third

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negative factor was the Civil War, which took sources of labor away from the home front and limited the ability of growers to ship crops out of state.

The vigorous growth of agriculture in spite of these drawbacks was testimony to the innate potential of the study area. In addition, the patterns of growth suggest that agriculturists were beginning to adapt to the natural potentials and limitations of the region. While cattle, sheep, hogs, corn, cotton, wheat, and other livestock and crops were raised everywhere in the study area, it was apparent by the 1860s that the region west of the Balcones Escarpment was more appropriate for stock raising than for intensive cropping. Favored animals in that area included sheep and Angora goats, and raisers in the region continued their experiments to improve both types of animals. Producers such as Thomas F. McKinney on Onion Creek had great success with their flocks, as did Elijah Sterling Clack Robertson on his ranch near Salado.² Production of Angora goats began in Hays County on a ranch owned by W. W. Haupt, and his stock soon spread as other ranchers realized the value of mohair.

Conversely, counties that lay entirely east of the Escarpment, such as Guadalupe, Caldwell, Bastrop, Milam, Falls, and McLennan, had the greatest increases in cotton crops and had reached levels of production by 1860 that approached commercial amounts. Indeed, production in Guadalupe County was enough to support a number of cotton processing facilities in Comal County, where one individual imported machinery to begin manufacturing cotton textile. A similar facility operated in Bastrop and serviced the growing number of plantation-level agricultural units on the Colorado River.

Agriculturists in those counties that straddled the Blackland Prairie and Balcones Escarpment regions tended to raise less cotton than those to the east, despite a notable increase in the number of slaves in every county north of Hays. Cattle raising, supported by the production of large amounts of corn, remained the largest part of the economy in counties that lay across the geographical divide. Served by the Shawnee Trail that predated the Mexican War and linked most of the counties in the study area, cattle producers increased their herds by as much as 800 percent between 1850 and 1860 and sent substantial herds north. In Hays County, for example, the Day family drove cattle herds north to Missouri and east to Louisiana, following a pattern that had been established a decade earlier.

AGRICULTURE FROM 1866 TO 1893

UNITED STATES

Agriculture in the United States after the Civil War and until the devastating Panic of 1893 and the subsequent multi-year depression entered a period of retrenchment, during which the federal government took an increasingly active role in regulation, the manipulation of markets, and the broadening of agricultural education. The country experienced a railroad boom from 1868 to 1873,

² For more information about Robertson's landholdings in Salado, please see Historic Context: Elijah Clack Robertson Plantation and Ranch, Salado, Bell County, Texas, Report of Investigations Number 59, Lopez Garcia Group, Dallas, Texas, prepared by Martha Doty Freeman, Sherry N. DeFreece Emery, and Deborah Dobson-Brown in 2007.

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when the transcontinental Union Pacific Railroad was completed (1869), followed by a national panic in 1873, a five-year depression, and then more than ten years of business expansion. During that decade of expansion, the federal government moved to manipulate markets by impositions of tariffs in 1883 and again in 1890. The McKinley tariff of 1890, for example, was highly protectionist toward domestic wool. Four years later, under the terms of the Wilson-Gorman tariff, sheep breeders found themselves treated less generously, and wool markets suffered as a result.

Federal interest in the safety of food products resulted in passage of meat inspection acts in the early 1890s, while concerns about infected cattle led the Bureau of Animal Industry to focus its attention on the tick fever that affected the cattle industry across the southern United States. In the realm of education, the federal government passed the Hatch Act in 1887 for the purpose of improving agricultural efficiency; in 1890, it passed a second Morrill Act that broadened the 1862 legislation and set up funding for African-American land grant schools.

States, as well as the federal government, appear to have had a new interest in regulation after the Civil War. As early as the 1870s, some states began to inspect dairy products. States also remained involved in agricultural education, and a number of colleges began experimental work by the 1870s. A total of forty-nine experiment stations existed in the United States by 1893. Key to passage of some of that legislation was the Grange, which was founded in 1867 and experienced tremendous growth by the mid-1870s. The Grange served members by promoting modern farming practices and by initiating legislation favorable to farmers concerning railroad and warehouse rates, educational programs such as the Cooperative Extension Services, and rural free delivery.

Expansion of federal and state programs was paralleled in the private sector by a continuous and increasingly rapid stream of inventions that assisted agriculturists in their work and boosted productivity. Among the most notable during the period of post-Civil War expansion were the appearance of steam tractors (1868) and spring tooth harrows (1869). Beginning in the 1870s, silos for grain storage appeared. Additionally, deep well drilling and extraction of water from aquifers became increasingly common and provided important benefits to farmers and ranchers because wells lessened their reliance on surface water and rainfall. During the 1870s, Glidden and Ellwood patented and manufactured barbed wire, an invention that resulted in the closing of the open range, altered patterns of land ownership, and motivated the movement of ranchers dependent on open range. Barbed wire also made possible the improvement of native cattle by the introduction of purebred stock that could be restrained and controlled.

By the mid-1880s, the availability of power clipping machines increased the productivity of labor involved in the wool industry, although the equipment was not universally available until the early twentieth century. The first gasoline-powered tractor was manufactured in 1892, and cream separators became widely available in the early 1890s, a boon to the growing number of farm families who produced milk for both home use and commercial distribution.

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The post-Civil War period has been described as the era of the Great Plains cattlemen, when the barrier of the High Plains gradually gave way to the press of cattle driven north on trails from Texas to mining camps in the Rocky Mountains and to rail lines running east–west that delivered the animals to distant markets. As early as 1866, there may have been as many as a quarter million animals that crossed the Red River and trended north to various markets. Subsequently, numbers of cattle ranged from 35,000 in 1867 to 600,000 in 1871 and 416,000 in 1884, for an estimated total of 5,713,976 animals driven between 1866 and 1885. However, disastrous winters between 1885 and 1887 killed more than 85 percent of the herds, bringing an end to two decades of expansion and vigorous markets associated with the cattle industry.

If growth in the national livestock industry was explosive immediately after the Civil War, changes in other aspects of post-Civil War agriculture were less spectacular. U.S. cotton production after 1865 remained relatively flat for a decade after the war because European markets had turned to other suppliers during the conflict and had little need of the American product immediately after it. The center of cotton production remained in the southern states that dominated before the Civil War until the mid-1880s, when Texas became the chief producer in the United States. In other areas of the country and with other crops, agricultural consolidation and specialization increased.

TEXAS

Following the pattern established by the federal government after the Civil War, Texas government also expressed its interest in agriculture through laws that addressed specific needs and problems. The first of these resulted from the loss of slave labor and the difficulty of replacing it with suitable levels of hired labor. Between 1866 and 1879, the state attempted to address the situation by passing additional homestead or preemption acts (1866, 1870, 1873, 1875, and 1879) and a constitution that affirmed the policy as a means of encouraging immigration and actual settlement on vacant state land. The state also created a Department of Immigration in 1871 that published brochures and literature about the agricultural and economic assets of the state and distributed them widely, including in Europe. Legislation in 1884 addressed violent activities by ranchers who objected to the closing of previously open ranges by passage of a fence cutting law that made cutting a felony. In 1891, concerned that rapidly expanding railroad lines were having a deleterious effect on agricultural and other economic activities, and at the urging of the Grange and newly elected Governor James Hogg, the legislature established the Railroad Commission with jurisdiction over rates and operations of railroads and other shipping entities.

Much of Texas was environmentally marginal, lacking the levels of rainfall characteristic of other regions of the United States. As a result, weather events continued to have significant impacts on agriculture, and settlement was uneven. For example, the prairie soils and sub-humid characteristics of Central Texas, where rainfall was more uniform, encouraged immigration to that area. As a result, there was increasingly intense development of the Blackland Prairie. However, much of the eastern half of Texas suffered from periodic droughts, and a particularly severe one in the early 1890s forced the liquidation of stock by ranchers already suffering the effects of a national panic. Indeed, it was the effects of panic,

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depression, and drought in the early 1890s that created an economic depression in Texas and resulted in the breakup of numerous large ranches as land prices plummeted.

The increased availability of steel-bladed plows and other machinery and agricultural items manufactured outside of Texas contributed to more-intensive cultivation of the Blackland Prairie and other areas of Texas after the Civil War. Glidden and Ellwood's barbed wire, for example, meant that crops could be cultivated safe from free-ranging herds. Ranchers, themselves, eventually benefited from the wire because it brought herds under control and made improved breeding feasible. The appearance of deep well-drilling rigs beginning in the 1870s opened areas of Texas range that had been only marginal due to a lack of surface water, and ranchers on the Edwards Plateau and in the Trans-Pecos region soon learned the benefits of drilled wells, pipe systems, and earthen stock tanks. Finally, the introduction of the DeLaval cream separator to Texas in the 1880s eased the burden of a labor-intensive process on the farm while also enabling larger-scale manufacture of milk products and the appearance of commercial-scale dairies proximate to growing urban centers.

Texans also contributed to the development of new technologies through experiment, invention, and manufacture. R. S. Munger, for example, devised a faster automated system of ginning (1883–1885), and his machines were sold widely throughout a rapidly expanding cotton belt. Most importantly for the cattle industry that had been plagued by Texas fever and embargos on infected animals, Robert Kleberg of the King Ranch identified ticks as the carriers of the fever. As a result of consultation with the U.S. Bureau of Animal Husbandry, Kleberg created an effective method to kill ticks when he built the world's first cattle dip in 1891.

As agricultural production increased after the Civil War thanks to demand, immigration, the spread of population, and the availability of technology, the expansion of transportation infrastructure became critical. Railroad companies expanded their tracks aggressively in Texas between 1873 and 1891, when the industry was unregulated and sufficiently robust to attract the attention of the newly created Railroad Commission. As late as 1879, all but 100 miles of the 2,440-mile Texas rail system were located east of the Balcones Escarpment. However, more than 6,000 miles of additional track were constructed in Texas in the 1880s, much of it west of the Balcones Escarpment. This expansion facilitated immigration to and within Texas and increasingly connected growers with state and national market centers. In addition, passage of a constitutional amendment in 1883 to provide for a county road tax meant counties had money and the responsibility to build roads within their borders.

As in the rest of the United States, Texas saw a significant increase in the number of agricultural organizations whose purposes were to educate members and represent their interests. The first Texas unit of the Patrons of Husbandry, or Grange, formed in Salado in 1873, and several years later the Farmers' Alliance organized. The Woolgrowers' Association formed in 1881 to defend members against legislation sponsored by cattlemen and to help combat scab and other diseases of sheep as infected animals moved in from California. In 1886, the Independent Colored Farmers' Alliance and cooperative Union organized, and the next year the Texas Farmers' Alliance, originally formed in the late 1870s, merged with the Louisiana Farmers' Union of America. Servicing the African-American agricultural

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community was R. L. Smith, who founded the Farmers' Home Improvement Society in Colorado County (1890) and promoted the spread of self-help programs throughout Texas, Oklahoma, and Arkansas. Many of these groups were instrumental in formulating public policies that eventually resulted in state legislation favorable to agricultural interests.

Such organizations promoted the education of members, who also received information through a plethora of new agricultural publications including *Texas Live Stock Journal* and *The Texas Farmer* (1880), and *Farm and Ranch* (1883). Of great importance was the establishment in 1887 of the Texas Agricultural Experiment Station (TAES), authorized by the Hatch Act of the same year, and the initiation of research projects by TAES scientists. Within two years, TAES was conducting field tests, and the Agricultural and Mechanical College of Texas began sponsoring instructional farmers' institutes.

Because of the impact of the Civil War and decade following on cotton cultivation and marketing, the period from 1866 to the early 1880s in Texas was dominated by the livestock industry. Using stock from open ranges, cattle drives resumed in 1866. Ranchers continued to move west into the Edwards Plateau in a search for free range following the introduction of barbed wire. Abundant rainfall in the early 1880s was particularly beneficial to cattle raising, which hit its peak in the mid-1880s. The number of sheep increased as well, and by 1880, 3,651,630 roamed Texas. Peak population counts occurred in 1884 to 1885. However, both sheep and cattle populations suffered significant losses due to extreme weather conditions in the mid-1880s. New highs in the late 1880s and early 1890s were followed by declines as a result of the national panic, economic depression, and drought. Sheep raisers, seeking new and better ranges, began to concentrate on the Edwards Plateau, moving northwest from the South Texas plains.

Movement of livestock west opened up areas east of the Balcones Escarpment for crop production. Cotton production remained relatively low as late as 1879, when 2,178,435 acres produced 805,284 bales, and Texas lagged behind other major cotton-producing states, probably due to an unusually dry year. But the same good weather that resulted in a spike in livestock production after 1880 also benefited cotton production, and Texas became the country's chief cotton state by the mid-1880s. Growers concentrated on the Blackland Prairie region, where soils were suitable to cotton cultivation and railroads facilitated transportation. By 1889, farmers produced 1.5 million bales of cotton on 3,934,525 acres.

While much agricultural effort focused on cotton, other crops were grown in enough quantity to be important contributors to the state's economy. The pervasive presence of grain mills throughout the eastern half of the state testified to the importance of wheat: in 1890, grain milling was second in importance of all manufacturing processes. Finally, while many creameries failed as late as the 1880s, milk production increased. By 1890, dairying was concentrated in Central Texas, which had suitable soils and plentiful rain. Throughout the state, 118,475,000 gallons of milk were produced in that year. Increased production in all of these areas—livestock, farming, and dairying—reflected a transition during the last quarter of the nineteenth century from independent, farm unit-level activity typified by lower production and diversified self-sufficiency, to agricultural units that exhibited greater

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specialization in their productions and increasing dependence on service to non-farm and ranch populations.

STUDY AREA

Agriculture in the study area immediately after the Civil War and until the national Panic of 1893 was characterized first by continuation of declining land and livestock values and a decrease in the number of farms per county, and then by a notable rebound as cattle drives resumed, multiple railroad companies extended lines to and through the area, and new populations of native- and foreign-born immigrants arrived with demands for land. In addition, major urban centers such as San Antonio, Austin, and Waco provided banking, trade, and other commercial services necessary to the support and promotion of agricultural activity.

The severe economic decline that had begun in the study area during the Civil War continued in some counties until the early 1870s, in part because of a lack of railroad lines. All of the 13 counties experienced significant losses in property tax receipts, in many cases because of the loss of slave property. However, losses of 35 to 50 percent in livestock and land values were not uncommon.

Monetary values associated with livestock production appear to have been the first to rebound during Reconstruction, probably because trail driving benefited from but was not wholly dependent on the existence of rail service. The existence of the north-south-running Chisholm Trail through the study area was a major asset, and feeder trails developed in every county. Such trails particularly benefited San Antonio, which was at the apex of one of the state's largest livestock production areas.

The slow livestock-dependent recovery of the late 1860s and early 1870s abruptly reversed during the mid-1870s thanks to the aggressive and rapid extension of railroads throughout the study area. By 1871 to 1872, the Houston and Texas Central Railroad had built through Travis, Bastrop, and Falls Counties, and McLennan County had access to the main line through the Waco and Northwestern Railroad. In the mid-1870s, the Galveston, Harrisburg, and San Antonio Railroad built through Guadalupe and Caldwell Counties to San Antonio; and the International and Great Northern completed a line through Williamson and Milam Counties. Railroad construction in the 1880s extended additional access to San Antonio by way of the International and Great Northern, which also served Hays and Travis Counties. Travis County also received service from the Austin and Northwestern Railroad beginning in 1882, while the Gulf, Colorado, and Santa Fe served Milam, Bell, Coryell, and McLennan Counties. Additional service in the 1880s was provided by the Missouri, Kansas and Texas Railroad (McLennan, Bell, and Caldwell Counties), San Antonio and Aransas Pass Railroad (McLennan and Caldwell Counties), Taylor, Bastrop and Houston Railroad (Williamson and Bastrop Counties), Texas and St. Louis Railroad (Coryell and McLennan Counties). The next effect was to tie the study area together with a transportation infrastructure and open up large areas of each county for agricultural and other development.

The growing network of railroads quickly unleashed the agricultural potential of the study area, particularly those aspects associated with crop production, processing, and marketing. Populations per

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county doubled and tripled during the 1870s and 1880s, and the numbers of farms and acres under cultivation grew at an even faster pace. The numbers of farms in Caldwell County, for example, grew by almost 400 percent during the 1870s, while improved acreage in Williamson County grew by a factor of 10, and the amount of improved acreage in Bell and Coryell Counties increased by approximately 700 percent. In many cases, the growth in numbers of farm units was accompanied by a decrease in the numbers of acres per unit. That pattern was particularly notable in McLennan County, where a number of Brazos River plantations were broken up and the land sold as smaller farms.

Agricultural output increased, as well, during the 1870s and 1880s. In many counties, cotton became the main field crop, and production commonly increased as much as 200 per acre between 1880 and 1890. Such increases, together with the accessibility to equipment made possible by rail service, made it feasible for smaller communities to build agricultural processing infrastructure. Gins, compresses, and mills became common elements in the agricultural landscape. Increases in wool production in Comal, Williamson, and Bell Counties spurred construction of woolen mills, such as the one in New Braunfels.

AGRICULTURE 1894 TO 1918

UNITED STATES

The two decades between 1894 and World War I were generally prosperous in the United States, with the exception of the relatively short-lived Panic of 1907, which was triggered by a liquidity crunch following the San Francisco earthquake of 1906. The era also was marked by federal legislation and programs that sought to continue an earlier pattern of controlling prices and quality while encouraging increased productivity. Between 1906 and 1917, alone, Congress passed the Food and Drug Act and the Meat Inspection Act (1906), Plant Quarantine Act (1912), Cotton Futures Act (1914), Federal Farm Loan Act (1916), and, in the face of entry into World War I, acts that controlled food and the production of commodities (1917). In addition, Congress passed the Smith-Lever Extension Act (1914) that established the federal-state extension service, and the Smith-Hughes Vocational Education Act (1917), both intended to provide direct education to farmers with the idea of improving plant and animal breeding. In the U.S. South, where cotton remained the most widely cultivated crop, there were efforts, largely unsuccessful, to diversify agricultural production. Government agents were joined by members of the largely urban-based and urban-oriented County Life Movement, who sought to change rural America fundamentally, making agriculturists more organized and efficient and, essentially, industrialized.

Educational programs available through extension services were intended to assist agriculturists, although it is not clear that many of them were interested in working with the agents. Of at least as much help in the quest for greater productivity would have been the gasoline-powered tractors that were available beginning in 1910, the pervasiveness of the U.S. railroad system, which peaked in 1916 at 254,000 miles, and the promise of better roads that the Federal Aid Road Act of 1916 intended to facilitate.

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TEXAS

Despite the considerable amount of railroad construction during the last quarter of the nineteenth century, Texas lagged far behind other states prior to 1918 and for many years thereafter. Even though Texas had the most railroad mileage in the United States by 1911, the sheer size of the state relegated it to the ranks of states with wholly insufficient means of efficiently transporting agricultural products. In 1900, there were fewer than 10,000 miles of rail. Nor would creation of a state highway department in 1917 do anything immediately to accommodate the almost 200,000 automobiles and other vehicles in Texas, many of which were used on farms and ranches to deliver agricultural produce.

Unlike agriculturists in some other states, many Texans appear to have been interested in the services provided by county agents and through the public schools. The appearance of the boll weevil on the Texas-Mexico border in 1892 and its rapid destructive movement through Texas and the U.S. South would have been motivation enough. That event and the subsequent general enthusiasm of agriculturists for experimentation and scientific information may have explained the success of Seaman Knapp in North Texas at the Porter Farm (currently a National Historic Landmark) in 1902. There, Knapp began the work that eventually led to passage of federal legislation establishing cooperative extension work. Only four years later, William Stallings of Smith County became the first county agent in the United States. Other extension work followed, with Edna Trigg of Milam County becoming the first woman county agent in Texas in 1912. The Agricultural and Mechanical College of Texas joined the Texas Agricultural Extension Service in 1914, and a Negro Extension Division was organized in 1915.

Helpful as government extension work was to Texas producers, education alone could not overcome the challenges that agriculturists experienced during the early twentieth century. On the positive side, cotton production more than doubled between 1889 (1.5 million bales) and 1900, and cultivated acres grew by two-thirds between 1900 and 1920, during which time the value of livestock more than doubled. Worldwide demand for wool for military uniforms spurred the growth of the sheep industry, and the idea of scientific dairying took hold as urban areas grew, along with their demand for milk. Mitigating against an ever-rising volume of agricultural product, however, was the rising cost of land, which raised the prices of commodities. Greater returns realized from farming already had made land in some areas of Texas too valuable for grazing. The combination of population growth, increase in commercial-scale agriculture, and expansion of railroads all contributed to a rise in land values. As result, small operators tended to find acquisition of crop and ranch land increasingly beyond their grasp.

In addition, the years from the early 1890s through World War I brought tumultuous weather that affected agricultural production to varying degrees. A record flood on the Brazos River in 1899 destroyed plantations and crops within the entire basin from the vicinity of Waco to the Gulf of Mexico. The Galveston Storm of 1900 repeated the damage as it moved to the interior of Texas before exiting the state. In 1913, record rainfalls poured so much water into the Brazos, San Bernard, and Colorado River basins that the three became one enormous river as they approached the coast. Finally, a crippling drought in the western half of Texas in 1917 to 1918, just as the federal government mounted its

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wartime campaign to “feed the world,” led to crop failures, migrations of farm and ranch families, and diminishing of the tax bases necessary to fund county road construction.

STUDY AREA

Agriculture in the study area after the Panic of 1893 until World War I and the record drought of 1917 to 1918 was characterized by fluctuations in levels and production and very few well-defined trends. Recovery from the effects of the Panic was slow, and agricultural enterprise took several years to reconsolidate. In general, however, the model of factory-level production appears to have kept agriculture moving in the direction of increasing acres cultivated, growth in specific crops, and consolidation of sheep and goat populations in the western parts of Central Texas counties. In addition, dairying became a wide-spread agricultural activity for the first time. Aided by the development of technology in the form of cream separators, increasing demand for milk products from growing urban centers, and promotion by trade groups, dairying began to spread. It achieved factory-level production in 10 of the 13 counties by 1899 and 7 of the 13 in 1919.

The period 1894 to 1918 also was marked by continuing activities by farm organizations and the growing role of the state and federal governments in farmer education and product control. Faced with the impact of the boll weevil and practical impacts of ever-larger acres devoted to intensive farming, the State Legislature funded operation of an experimental station near Temple in Bell County that conducted research and produced solutions to problems typical of the study area. County agents were active throughout the area and worked to provide the latest in scientific agricultural education to local agriculturists.

In most of the study area, farmers worked through the first decade of the twentieth century to increase cotton production. Acres devoted to cotton and bales produced peaked in Guadalupe, Bastrop, and Williamson Counties in the very early twentieth century. But the negative impacts of the crop on local soils already were taking a toll on production, and statistics for the study area indicate either a decrease in bales of cotton ginned or a significant slowing in the rate of increase. County agents and the popular press emphasized crop diversification, but the response from the agricultural community was rarely positive. However, farmers in some counties turned increasingly to the cultivation of oats, wheat, and corn when markets and demand, particularly during World War I and immediately after, made the change profitable.

Specialization within the livestock industry became prevalent as well, with factory-level production responding to demand for meat in growing urban centers and for meat, wool, and mohair by the federal government during World War I. Production was assisted by continuing definition of geographic areas best suited to each species of range animal. Continuing work to improve breeds and availability of technology—windmills, fencing, and dipping vats—increased stockraisers’ ability to maximize the use of range and increase output.

AGRICULTURE FROM 1919 TO 1929

UNITED STATES

The problems associated with U.S. agriculture immediately after World War I continued into the early 1920s as the country grappled with a postwar recession. Commodities collapsed due to continued large production that had fewer market outlets. The federal government stepped in and tried to control the crisis by imposing tariffs. The economy failed to improve, however, until after 1923, when President Coolidge, a fiscal conservative, slashed federal budgets and set the stage for a return to federal surpluses. The decade was not without its problems. But until 1929, when years of significant economic growth and speculative boom terminated in a stock market crash, the 1920s were an era that was favorable to agriculture.

As in earlier periods, new developments in transportation and technology benefited agriculture. Invention of the cotton stripper assured the dominance of that crop, and mechanized power expanded the capacities for planting and harvesting. Expanding federal and state road systems paid for by county, state, and federal governments facilitated trucking, which was essential to the safe shipping of perishables such as milk. Farm organizations that represented the interests of growers became newly active, setting up a strong presence in Washington, D.C., that lobbied for favorable legislation. Particularly noteworthy was the spread of the cooperative movement, particularly after the Capper-Volstead Act of 1922 gave cooperatives legal standing. By 1930, the United States was home to 11,950 cooperatives representing three million members.

TEXAS

Like the rest of the United States, Texas entered a period of agricultural prosperity that began with record rainfall in 1919 and record crops, a collapse of wool prices after the war, and the improvement of that market thanks to the imposition of federal tariffs in 1921 to 1922. A combination of federal and state action to fund, extend, and maintain Texas highways resulted in a total of 18,728 miles of main highways (9,271 hard surfaced) by 1929. In turn, extension of highways throughout the state assisted more direct connections between agricultural units and markets.

Thanks to improving markets, ever-increasing demand for staples, growth of urban centers, more railroad mileage, and slowly improving roads, almost every aspect of Texas agriculture expanded after about 1922. Sheep and lamb populations, which now centered on the Edwards Plateau and eastern Trans-Pecos regions, grew to 7,021,334 animals by 1930. Regulations insuring the safety of milk products contributed to an increase in milk production by more than 35 percent between 1920 and 1925. Increasing demand for cheese products and the success of the Texas Cooperative Marketing Act spurred milk production to grow again by 50 percent between 1925 and 1930. The impressive growth of commodities during the 1920s was paralleled by increases in the numbers of farms and acreage. The number of farms in Texas grew by almost 14 percent (approximately three times the amount of growth

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between 1910 and 1920), while farm acreage grew by 9.4 percent (approximately 7 times the amount of growth during the previous decade).

STUDY AREA

Agriculture in the study area between World War I and the eve of the Great Depression was characterized by distress in the area of farming, stasis in the livestock industry, and growth in dairying. The decade also saw growing strength in truck farming and poultry raising. In some counties, such as Caldwell, almost exclusive reliance on agriculture lessened as oil fields developed and the economy diversified beyond crops and livestock.

A plunge in cotton markets due to record production in 1920, a decrease in production per acre due to soil depletion and increasing dependence on marginal land, and the effects of unchecked boll weevil infestations all continued to weigh heavily on the cotton industry in Central Texas. (An exception was Falls County, where the 1929 cotton crop was the largest ever harvested.) In addition, yields of wheat, corn, and oats decreased in the study area during the 1920s. In many counties the average crop value decreased by one-half, despite the fact that the amount of cropped land decreased by only one to 10 percent.

Livestock, on the other hand, experienced slow growth in at least half of the counties, and other aspects of agriculture developed in response to improved roads and the demands of growing urban centers along the north-south-running corridor of the Meridian Highway—present-day IH-35. Small truck farms that appeared supplied vegetables and other garden produce to city dwellers. The chicken industry expanded as well, with many counties in the study area showing gains of well over 100 percent in poultry production.

The agricultural industry that experienced the greatest growth in the study area after World War I was dairying, as the demand for milk and milk products such as butter, cheese, and ice cream skyrocketed. The numbers of dairy cows per farm decreased, but production per cow increased thanks to improved breeding. During the 1920s, the study area led the state in milk production, and numerous cheese factories and creameries were constructed in large cities and small towns to process the increasing volumes of milk while meeting local and more-distant demand for dairy products. McLennan, Bell, Williamson, Travis, Bexar, Falls, and Guadalupe were among the top milk-producing counties in Texas after World War I, and the remaining counties in the study area were not far behind.

AGRICULTURE 1930s TO 1945

UNITED STATES

The prosperity experienced in much of the United States after World War I ended in the early 1930s after the collapse of markets and the banking system, and the onset of drought conditions in much of the country. A recovery from depression that peaked in 1936 abruptly ended in a severe recession

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beginning in 1937, due at least in part to actions by the Treasury Department. Reversal of federal policy in mid-1938 was followed by another recovery, but sustained recovery did not recur until after the entry of the United States into war in 1941.

Economic depression resulted in the formulation and implementation of federal programs across the country, some of which were helpful to agriculture and others of which simply created additional problems that new regulations were created to address. In 1933, the far-reaching Agricultural Adjustment Act (AAA) initiated crop and marketing controls; a specific program known as the “cattle shoot” targeted the purchase and killing of livestock, including cattle and sheep, in an effort to manipulate markets by diminishing the sizes of herds and flocks. Passage of the Soil Conservation Act in 1935 created the Soil Conservation Service (SCS) and Range Management Program, which emphasized contour ridging, tree planting and cultivating, and construction of erosion-retarding dams and terraces as well as earthen tanks and reservoirs. In addition, flood control acts passed in 1936, 1944, and 1954 assigned the Watershed Protection and Flood Prevention Program to the SCS, which constructed numerous dams throughout the United States. These flood control acts were designed to complement the work of the Corps of Engineers.

In 1938, programs overseen by the AAA expanded, and the following year, the government began a food stamp program that was authorized by the Food Stamp Act. The program was intended to alleviate hunger during the depression by allowing low-income households to purchase food using coupons. The same year, Congress passed an act favorable to wool and mohair producers. Called the Wool Products Labeling Act, the legislation required manufacturers to label items accurately with the fiber content and origin. Similar programs continued during World War II and beyond, when price controls and food rationing were widespread.

Federal intervention and formation of new lobbying groups also occurred in areas more peripheral but still pertinent to agriculture. Federal road-building projects of the 1930s emphasized improvements to major highways because of their importance to military installations and troop and supply movements, and to secondary roads due to their importance to food producers. In 1935, the Bankhead-Jones Agricultural Act more than doubled federal support of extension work; by 1940, the broad appeal of agricultural education was apparent in the 584,000 students enrolled in agricultural classes. On the non-governmental side, the interracial Southern Tenant Farmers Union was formed to help support sharecroppers who had been displaced by New Deal programs such as the AAA. The organization called for repeal of the AAA and sought to draw attention to social and economic issues associated with farm tenancy.

National crop and livestock production became driven by the practicalities of drought, requirements of new federal agencies and programs, and eventually the needs of a country at war on a global scale. Programs created in the 1930s that sought to restrict crop and livestock production reversed focus during the early 1940s, when the federal government called for a “food for defense” response that mirrored that of World War I. Agriculturists responded with record production of wheat and other commodities despite shortages of agricultural implements and equipment. Equally serious were labor

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shortages that were alleviated partially by development of a *bracero* program manned by Mexican immigrants.

TEXAS

Texas agriculture during the Great Depression and World War II experienced many of the economic conditions prevalent elsewhere in the United States and dealt, as well, with federal programs that heavily impacted the state's traditional agricultural society. For example, the federal "cattle shoot" program of 1934 resulted in the removal of a large percentage of animals (primarily cattle and sheep) from the range after low livestock prices in the early 1930s caused ranchers to hold animals from the markets. Other programs built erosion-retarding dams and contour ridging for the purpose of alleviating the twin impacts of drought and overgrazing. This work, with terracing, also helped to reverse the effects of decades of intensive farming.

Several factors ensured that much of Texas fared better than other areas of the United States. For example, while severe drought affected the Texas Panhandle and general South Plains areas, other parts of the state were less affected. Perhaps most importantly, the federal government directed significant levels of funding to military installations in Texas beginning in the late 1920s and expanding dramatically through World War II. This funding helped mitigate the impacts of depression in Texas that were experienced more strongly elsewhere. Federal programs also assisted with the improvement of numerous state and federal highways throughout the 1930s. By 1936, Texas had a highway system that totaled more than 21,000 miles. Finally, railroad mileage of approximately 17,000 miles contributed to the transportation infrastructure, an essential element in a national defense system that depended on the movement of troops, equipment, and commodities.

Between the late 1930s and the end of World War II, Texas agriculture prospered due to demand for meat, dairy products, and natural fibers. The numbers of sheep began to climb precipitously by 1936, and by 1941, the state had 19 percent of all sheep and lambs in the United States, most of them in the area of the Edwards Plateau. By the next year, Texas had more sheep than any other state by a wide margin. Mohair production followed a similar pattern, with Texas producing 89 percent of all mohair in the country. Milk production continued to grow strongly, and the wheat harvest of 28,096,367 bushels in 1939 had grown to 81,415,285 bushels in 1944.

STUDY AREA

Agriculture in the study area between the beginning of the Great Depression and the end of World War II experienced a shift that continued, at a much-accelerated pace, changes that had begun by the late 1920s. While the economy of the 13-county region remained primarily agricultural, the relative values of agricultural products changed: cotton continued a downward trend in production, and livestock, livestock products, and dairy products all continued the post-World War I upward trend.

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Tenancy and sharecropping reached peaks throughout the study area in 1930 and then declined thereafter through World War II and after. In parallel developments, farms lost up to 70 percent of their values per county, and the number of farms in each county dropped significantly. That trend signaled the beginning of a shift from smaller family farms to the larger commercial operations that were necessary to sustain the twentieth-century move to industrialized agriculture. Acres planted in cotton and yields decreased noticeably as government and educational programs preached the message of diversification and encouraged participation in projects intended to repair the agricultural landscape and replenish soils. The Elm Creek Watershed Project, in particular, required government-sponsored collective cooperation among farmers in eastern Bell County that would have been alien to them prior to the 1930s. The Elm Creek work, the largest such project in the United States, dramatically altered approximately 300 square miles of the Central Texas agricultural landscape and introduced new agricultural practices.

During the 1930s, farmers in the 13-county study area turned away from cotton cultivation. By the late 1940s, Bastrop County, for example, had one-sixth the number of acres planted in cotton as it did in 1920. Williamson County saw an almost 50 percent decrease in acres planted in cotton between 1929 and 1939 and a drop of 46 percent in yield; Bell County experienced almost identical trends. Coryell County decreased its acreage planted in cotton by more than 50 percent, and Falls County, where 1929 was the year of greatest cotton yield, saw its total bales fall by 57 percent during the 1930s.

As land was freed up from cotton cultivation, it became available for use by grazing animals and for raising feed crops. Following a thinning of herds during the 1934 cattle shoot, cattle, sheep, and goats came back strongly in the study area. Legislation that was favorable to wool and mohair production in the late 1930s and the war effort that stimulated fiber production and the raising of beef animals all stimulated ranching in the 13-county study area. Feed crop cultivation increased as well. Wool and mohair production more than, or nearly, doubled in Williamson and Bell Counties. In Coryell County to the west, mohair production in 1939 was higher than it had been in 1919 by a factor of 7.5, and wool production was 20 times more. In Falls County to the east, cattle numbers increased by 25 percent and sheep by 61 percent in the 1930s. Dairying remained strong as well, as farmers who previously had devoted their efforts to single-crop cultivation were encouraged to diversify, and the demand for milk products remained high.

AGRICULTURE POST-1945

UNITED STATES

Following World War II, the industrialization of American agriculture that began earlier in the century achieved completion, thanks to increased mechanization, spread of scientific agriculture, and marketing of American-grown commodities to international markets. Despite a steady decrease in the numbers of individuals employed in agriculture relative to the total population (21.5 percent in 1930, 16 percent in 1945, and 4 percent in 1970), U.S. agricultural exports grew by almost 600 percent between 1955 and 1980. This expansion contributed to a postwar boom of large proportions that included construction of a

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more comprehensive national system of interstate highways and the increasing use of trucks and barges that assisted in the transportation of commodities to markets.

The post-World War II era also was marked by significant contributions to agricultural technology. The shift from horses and mules to tractors, as well as the development of new automated farm technology, made an enormous contribution to productivity. By 1968, 96 percent of cotton was harvested mechanically, and two years later, tractors replaced virtually all animal power. Development of chemical fertilizers and pesticides after the war also increased productivity per acre. Largely successful efforts to control foot-and-mouth disease and screwworms, and to eradicate hog cholera, made significant contributions to the success of the livestock industry. Development of hybrids and new high-yielding varieties of grains led to more crops grown on increasingly larger land holdings, in turn solidifying the trend to commercial-scale production on both farms and ranches. This trend eventually became a dominant pattern in many areas of the United States.

Certain federal acts also supported and stimulated agricultural production by creating additional demand, among them the National School Lunch Act of 1946 that helped absorb farm surpluses by providing low-cost or free lunches to school children. The Food Stamp Act of 1964 echoed the 1939–1943 Food Stamp Plan and allowed low-income households to purchase food using coupons. The Agricultural Acts of 1949, 1954, 1961, and 1964 addressed topics such as price supports, acreage allotments, and voluntary controls on production.

The flourishing character of postwar American agriculture and numbers of returning veterans increased enrollment at land grant colleges. By 1970, 853,000 students were enrolled in agricultural courses. Apparently, careers in agriculture were not readily forthcoming, however, since the percentages of population employed in agriculture continued to decrease due to the spread of agri-businesses that were highly mechanized and required less human labor. Those individuals who were part of the active workforce demonstrated a continued proclivity to organize: the Southern Tenant Farmers Union of the 1930s remained active as the National Farm Labor Union after World War II, and a new organization, the National Farmers Organization, formed. Other organizations such as the United Farm Workers promoted unionization of farmworkers, and Congress modified the Fair Labor Standards Act in 1966 to embrace agricultural labor. The traditional cooperative movement experienced a decrease in membership, but still had a large number of members. In the 1950s, 10,051 cooperatives had 7 million members, while 7,994 cooperatives had 6.2 million members in 1970, a significantly smaller decrease than in the overall agricultural workforce.

TEXAS

As had occurred during World War I, agricultural prosperity in Texas after World War II was delayed due to a pan-regional drought (the third worst for the period 1523–2008) that devastated livestock and crops. The drought began shortly after Texans harvested a record 75,277,232 bushels of wheat (1949) and the most cotton since the 1919 record crop. Agricultural production rebounded strongly after the

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drought broke. Cotton, which centered in the northwest quadrant of the state, but was gradually extending back onto the Blackland Prairie, rebounded to 4,155,986 bales in 1959.

Angora goat herds and pounds of mohair clipped reached record highs in 1965, but then trended lower despite occasional tariff protections and price supports. Milk production remained strong after World War II, despite federal price controls that proved problematic and resulted in a rash of bankruptcies. During the 1970s and 1980s, Texas ranked in the top 10 states. Finally, beef cattle production rebounded after the drought and remained strong for much of the second half of the twentieth century. Large-scale operations on the High Plains combined with numerous small-scale operations that characterized the eastern two-thirds of the state to sustain a vigorous cattle industry.

Twentieth-century Texas agriculture was characterized by reactions to weather that often vacillated widely between drought and plentiful rain. Those vacillations usually resulted in dramatic economic downturns, agricultural inactivity in more environmentally marginal areas, and boom–bust cycles. Elements that helped to mitigate those negative factors and reactions included the investment by both the state and federal governments in rural paved roads after World War II. The period saw construction of the most extensive system of secondary roads in the world under the farm-to-market system. Other contributors to agricultural stability included the development of new grain sorghum varieties, the availability of chemicals and improved seeds that increased productivity, mechanization of crop harvesting, the widespread availability of equipment that increased per-day tillable acres, and technologies that tapped the prolific aquifers that underlay parts of the state.

STUDY AREA

Agriculture in the study area after World War II continued on an increasingly industrial track as activities became more fully mechanized, numbers of agricultural units decreased, and sizes of individual units became larger. The percentage of agricultural units operated by tenants continued the post-1930 decline. By the early 1980s, the percentages for each county ranged from 12 percent in Falls County to approximately 6 percent in Guadalupe County, notably lower than the peaks well above 50 percent that were common in the early 1930s.

As in the early-to-mid-twentieth century, the amount of land being used for agricultural purposes remained high in each of the 13 counties. In the early 1980s, a sample of six counties reveals that the percentage of land categorized as agricultural ranged from 63 percent in Travis to 83 percent in Caldwell. Land used for agricultural purposes in Coryell County outside of the acres within Fort Hood represented 88 percent of the county's total size. Interestingly, however, the large amounts of agricultural land did not translate into equivalent cash values. In every county in the study area, receipts for sales of agricultural products represented a relatively small percent of total cash receipts, a statistic that suggests that, while landscapes remained agricultural in appearance as late as the 1980s, money generated by agriculture was far less than that generated by other, non-agricultural activities in each county.

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In general, the preference for livestock that had been apparent by the 1940s continued through the end of the twentieth century. Out of cash receipts resulting from sales of agricultural products, the greatest part resulted from sales of livestock (cattle, sheep, goats, chickens, turkeys) or livestock products (wool, mohair, milk, eggs). In the early 1980s, a sample of eight counties in the study area revealed that receipts from livestock and livestock products ranged from 60 percent of agricultural receipts (McLennan County) to 85 percent of total agricultural receipts (Comal County), a statistic that reveals the strong preference for livestock as opposed to crops that characterized the area.

As a result of this preference, agriculturists continued to emphasize production of hay and sorghum. Both of these crops were among the most frequently raised in Bexar, Comal, Guadalupe, Caldwell, Travis, Bastrop, Williamson, Milam, Bell, and Falls Counties after World War II. Additionally, agriculturists increasingly practiced what would have been identified as diversified agriculture earlier in the twentieth century. Depending on their proximity to growing urban centers, farmers grew vegetables and fruits including pecans in amounts sufficiently large to be commercially viable. An ever-increasing number of operators also began to raise poultry. By 1970, Bell County raised more turkeys than any other county in the state. By the 1980s, much of the Blackland Prairie region was characterized by diversified dry land stock farms that combined cattle raising with wheat, sorghum, and cotton cultivation, and with the raising of poultry.

SUMMARY

For more than 300 years, agriculture has been an economic engine in the United States generally and in Texas and the study area specifically. By the eighteenth century, agriculture was firmly established as the basis of subsistence living. Changes to its structure for the next two centuries involved movement beyond subsistence to commercial-level production and increasing specialization within geographic sub-regions. As in other areas of the United States, Texas agriculture has responded to underlying environmental factors such as weather, soils, and water, and to man-made factors such as economic cycles, government programs, technology, and development of a transportation infrastructure. The history of response and the associated development of agriculture and agricultural landscapes in the Central Texas study area comprise the following sections that discuss the history of farming, ranching, and dairying in the 13-county study area.

FARMING TRADITIONS IN THE STUDY AREA

HISTORIC BACKGROUND

Like all agricultural ventures, crop production is subject to and influenced by many outside factors including rises and falls in the economy, weather events and climate changes, and technological advances. These and other factors shaped the development of crop production in Central Texas, which evolved from subsistence farming prior to 1870 to small commercial farming until just after World War II to large commercial and agribusiness farms in the post-World War II years.

Prior to 1870 and the arrival of the railroad, crop production in the study area was primarily devoted to subsistence farming with a focus on corn cultivation. While the area experienced an influx of settlers during this time, the majority of them were poor, and the lack of transportation networks prevented cost-effective methods of shipping crops to markets. Once the railroad arrived in the 1870s and early 1880s, crop production in Central Texas shifted from subsistence to commercial farming. Additionally, technological advances in machinery used for plowing and crop cultivation, as well as an increase in settlers from Europe, contributed greatly to the boom in crop production. Although crop production focused heavily on cotton, farmers also began diversifying by the turn of the twentieth century, producing more corn, wheat, and oats.

A fluctuating economy, a world war, staggered droughts, and boll weevil infestation in the first few decades of the twentieth century resulted in uneven rates and amounts of crop production. In addition, prices fluctuated, sometimes so much so that state and national agricultural economies suffered from unsustainable booms and severe recessions. The Great Depression brought new federal farming assistance, education programs, and advances in soil conservation. World War II marked another shift away from cotton in Central Texas and toward other grain and livestock production. Postwar farming in the study area is marked by more technological advances, the introduction of hybrid crops, and a shift to fewer but much larger farms.

DEVELOPMENT PERIOD: PRE-1870

The pre-1870 agricultural history of the study area was dominated by subsistence farming, with some production of cash crops. Although the region saw a major influx of new residents during this period, several factors kept cultivation activities relatively constrained between the 1820s and late 1860s. These factors included a lack of intensive settlement in the Blackland Prairie and a lack of formal transportation systems to bring crops to markets. Consequently, while there were examples of plantation-level operations and improvements in most of the 13-county study area, agricultural properties more often were characterized by modest residences and smaller outbuildings including sheds and barns.

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Governments of Spain, Mexico, and Texas all encouraged the early settlement of Texas. During the eighteenth century and until 1821, the government of Spain made grants of land to establish missions and presidios; other grants were made to members of colonies and individuals who raised livestock. After 1821, the government of Mexico made grants to *empresarios* such as Stephen F. Austin, whose District of Mina included much of Central Texas in the vicinity of Bastrop County, and Sterling Clack Robertson, whose colony embraced about 30 modern-day counties in an area approximately 100 miles wide that centered on present-day Waco in McLennan County. Beginning in 1835, the Republic of Texas gave land grants to immigrants who were living in Texas by March 4, 1836, and other specific dates, or who provided service to the Republic. Another influence on settlement was the passage of the first Pre-Emption Act in 1845, which allowed residents to purchase up to 320 acres of public lands that they had improved or farmed for three years (Lang 2012; Long 2012). Although the Texas Legislature reduced the number of acres to 160 acres per settler in the late 1850s, the intent was the same—to bring people to the area and improve the land in the process.

Immigrants from the Middle and Deep South were recipients of the majority of colonization grants after 1821. Beginning in the 1830s and continuing in the 1840s, there also was a significant influx of Germans to the area. The initial German immigration to Texas began with German-born Johann Friedrich Ernst, who received land in Austin's Colony (Austin County) in 1831, and enticed friends and relatives in Germany to come to Texas (Jordan 2004:41). A second, larger migration of German immigrants to Texas began in the mid-1840s. Many immigrants who landed at the coastal port of Indianola were directed to two leagues of land at Comal Springs in present-day New Braunfels that had been purchased by Prince Carl of Solms-Braunfels in 1845. Immigration and settlement activities were overseen by Commissioner John O. Meusebach, who also established a colony on the Pedernales River. Following the settlement patterns of the Anglo Americans, the German immigrants established scattered farmsteads throughout Central Texas (Jordan 2004:45-47, 94). Within the German settled communities, stone buildings were especially common. With abundant limestone and a number of settlers possessing stone masonry skills, German immigrants used limestone in the construction of their residences and ancillary structures, such as barns, coops, smokehouses, and cisterns. German immigrants in the region also built stone fences to separate their domestic zone from their work zones and fields. (For more information on agricultural zones found on an agricultural property, see Property Type Development section.) Some scholars, such as Laura Lynne Knott, argue that German immigrants prolifically built with stone because rock construction gave immigrants a sense of permanence in and commitment to their new country (Knott 2004:13).

Early settlement patterns illustrated that the majority of the newcomers in Central Texas settled along major river valleys associated with the San Antonio, Guadalupe, Colorado, and Brazos Rivers and around streams and rivers east of the escarpment in the Blackland Prairie. Several histories note that before the Civil War, much of the Blackland Prairie, with its rolling prairies, was viewed as more suitable for raising livestock. In later years, this area proved to be very fertile for crop cultivation, especially cotton (Amsbury 1993:136; Stabler 2010:41; Smyrl 2012).

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As Central Texas received an influx of new settlers to the region in the mid-nineteenth century, the majority of these newcomers were poor, and many of those from the U.S. South were yeoman farmers who had no or few slaves (Jordan 2004:10). In fact, during the antebellum years, the majority of farmers in Central Texas had few slaves, and only a handful of owners had a large numbers of slaves. Slave labor was used in sheep and cattle ranching enterprises, but was not in high demand because cotton—a labor-intensive crop—was not commonly grown in Central Texas outside of plantations along the Guadalupe, Colorado, and Brazos rivers. While cotton was a cash crop, it did not become a profitable crop until after 1870 when railroads were built through Central Texas, steel-bladed plows became more widely available, and cotton fiber could be shipped to markets easily and cheaply. Due to the cost of transportation prior to the 1870s, the main cash crop during the antebellum years was corn. Corn appeared to be more popular since it was easily sold at local markets for human and livestock consumption, particularly after the 1850s when cattle, sheep, and goats were widely raised. Grains such as oats, wheat, and barley were also widely grown for the same reasons.

High livestock prices, combined with the lack of formal transportation systems, resulted in the slow evolution of widespread cultivation of cash crops. Furthermore, during the pre-1870s era, droughts plagued Central Texas, with the worst one between 1857 and 1859. These factors, coupled with a lack of understanding of the fertility of the Blackland Prairie soils, led to the dominance of livestock raising in Central Texas. (For more information about ranching during this time period, see the Ranches section.) A major shift in the agricultural history of Central Texas began in the 1870s with the invention of barbed wire fencing, growing availability of tools suitable to cultivation of the Blackland Prairie, and the construction of railroads through Central Texas.

DEVELOPMENT PERIOD: 1870 TO 1893

Agriculture in the study area during the last quarter of the nineteenth century was characterized by a sharp increase in improved farm land and cash crop production, as well as thriving cotton cultivation in the eastern counties and the diversification of crops including corn, wheat, and oats in the western and southern counties. Subsistence farming gave way to agricultural production as an economic pursuit. Improved transportation, technological advances, and an increase in the immigrant population contributed to the successful agricultural economy of Central Texas. As a result, the built landscape during the 1870s through early 1890s looked much different from the pre-1870s period as agricultural properties shifted from a ranching focus to a focus on ranching and cultivation—particularly in the eastern part of the study area. (For more information about ranching, see the Ranches section.) With the widespread use of barbed wire, invention of riding and larger walking plows, the introduction of silos, construction of railroads in the study area, and gradual abandonment of self-contained agriculture in preference for commercial agriculture, farming became a more profitable pursuit in Central Texas and throughout the state. As a result, equipment sheds, shops, and silos were prevalent in the agricultural work zone during this period, while crossroads and larger commercial centers became the locations of gins, cottonseed oil mills, compresses, and textile mills (Spratt 1970:64, 76-80).

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Improved and new transportation systems allowed for transport of goods to new and emerging markets in the region and state. The railroad arrived in the study area as early as 1870 in Falls County and as late as 1882 in Coryell County. An interurban rail was constructed between Waco in McLennan County and the city of Dallas, and a suspension bridge was built over the Brazos River in Waco.

As noted above, several technological advances contributed to the success of farming during this period. Specifically, the introduction of the horse-pulled steam engine, riding plows, and larger walking plows allowed farmers to plow more acreage in less time. The invention of barbed wire in the 1870s and its widespread availability by the 1880s kept livestock separate from crops. The 1873 invention of silos also enabled farmers to store grains and corn before sending them to market, rather than storing them in large trenches that were subject to spoilage during wet years.

Per county, the average acreage of improved farm land in the study area in 1870 was 29,617 acres. By 1890, that number had increased dramatically to an average of 225,882 acres, a 660 percent increase in only twenty years. The number of farms in McLennan County jumped from 937 in 1870 to 3,256 in 1880. Before 1870, corn production was limited to subsistence farming. However, by 1889, McLennan, Williamson, and Bell Counties produced over 1,000,000 bushels of corn, with the remainder of the counties in the study area producing between 350,000 and 1,000,000 bushels each per year. The western counties also experienced growth, but to a lesser degree since production in that area was focused more on livestock and only minor wheat, corn, and oat cultivation (Connor and Odintz 2012; Odintz 2012; Smyrl 2012; Texas Planning Board n.d.g; U.S. Census Bureau).

The study area also had an influx of immigrants from Eastern Europe who had left overpopulated countries where farm land was becoming scarce. The Texas Bureau of Immigration, formed in 1871, advertised the benefits of settling in Texas. The bureau sent agents and promotional materials across the country, as well as to Europe (Rozek 2012). In particular, German and Czech immigrants migrated to Central Texas, establishing communities in the study area and concentrating in Bexar, Comal, Guadalupe, and Bell Counties. In the 1880s, the population of Guadalupe County was 12,202, of which 40 percent was of German descent (Smyrl 2012). Mexican immigrants also arrived in Texas during this period. Bexar County had a population of 30,470 residents in 1880. Of those residents, over 25 percent were foreign born, including 11 percent from Mexico and over eight percent from Germany (Long 2012).

Most of the immigrants and many former slaves were tenant farmers or sharecroppers. Tenant farmers provided their own labor, equipment, horses/mules, and seed. They could have one of two types of arrangements with owners – 1) the tenant farmer could keep two-thirds to three-fourths of the crop or 2) they could pay a fixed rental fee to the landowner and kept all proceeds from the sale of the crop. In contrast, sharecroppers often had no financial assets or equipment and merely farmed the land in exchange for a share of the crop (Conrad 2012). Sharecroppers depended on the farm owner for their housing as well as farm supplies and implements. In Bell County, where the population doubled between 1870 and 1880 to 20,517 residents, tenants worked 41 percent of farms (Lewis 1948:7). In Guadalupe County, tenant farming and sharecropping occurred on 25 percent of the farms. The large increase in immigrants in Texas and Central Texas resulted in a large labor force for crop production. As

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a result of the widespread practice of sharecropping and tenant farming during this period, small houses located near or in the agricultural work zone were constructed for the farm workers. These sharecropper and tenant houses often were surrounded by small domestic zones. As such, properties often had multiple domestic zones, although the domestic zone surrounding the main house would be the largest on the property.

With a large labor force, a growing railroad network that made shipments economical, and the singular economic benefits of cotton cultivation, over 30,000 bales of cotton each were produced in 1889 in McLennan, Bell, and Williamson Counties, while Caldwell, Bastrop, and Guadalupe Counties each produced between 20,000 and 30,000 bales (Connor and Odintz 2012; Odintz 2012; Smyrl 2012; Texas Planning Board n.d.h; U.S. Census Bureau). These large amounts represented tremendous increases over the 1879 cotton crop of approximately 250 percent to 700 percent. The large increase in crop production coupled with the rise in population contributed to the formation of the Grange movement in Texas in 1873. Based in Salado in Bell County under the name Patrons of Husbandry, the movement promoted a higher quality of living for farming families, centered on family and educational and cooperative business opportunities. The movement's political interests included lobbying for more favorable railroad shipping rates. By 1879, the Texas State Grange had 352 members and 122 clubs, increasing to 13,402 members in 1884 (Smith 2012). The Farmers' Alliance was formed in Lampasas County in the late 1870s. The Alliance, which also stressed farm cooperatives to control prices, lower tariffs, and passage of a graduated income tax, among many of their agenda items, soon took over a number of the Grange's purposes. By the mid-1890s, both organizations had lost much of their power and membership, although their aims lived on in the Populist Party and twentieth-century farmers' organizations (Spratt 1970:151-209).

DEVELOPMENT PERIOD: 1893 TO 1920

This period in agricultural production in the study area was characterized by fluctuating success in crop production, largely due to the Panic of 1893, World War I, and the 1917–1918 state-wide drought. The Panic of 1893 was a result of several factors, including railroad finance instability due to overbuilding and a decline in gold and silver values. These factors, combined with the flood of crops on the market in the last two decades of the 1800s, resulted in market crop prices drastically dropping and farmers unable to recoup costs. Many abandoned their farms, and the acreage of improved farm land in the study area decreased by an average of 33,700 acres. Coryell County dropped from 267,076 acres of improved farm land in 1890 to 206,555 in 1900. Improved farm land in Travis County decreased by 24,000 acres between 1890 and 1900 (U.S. Census Bureau).

Farmers also began shifting away from cotton production due to low market values and continuing soil depletion. Farms began diversifying, introducing corn, wheat, and oats alongside increased livestock production, especially in the southern counties in the study area. In Comal County, cotton production dropped by almost half between 1889 and 1919 to 3,920 bales while oat production increased to 200,000 bushels. Bell County, one of the leading counties in the state for cotton production, continued to increase its yield during this period but at a much slower rate, increasing only 2,000 bales between

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1899 and 1909 from 56,560 to 58,050. Falls County dropped from a peak of 59,894 bales in 1899 to only 37,974 in 1919. Conversely, pecans, one of the earliest cultivated crops in the state, saw increasing production. Initially the popular thinking about pecan cultivation was that the trees needed to be grown along rivers and streams with good soil, water source, and drainage. However, by the 1920s, farmers realized that pecans could be grown virtually anywhere. Most of the pecans in the study area were grown in the southern counties where crop diversification was particularly popular. Bexar County, with its large migrant Hispanic population that was a ready labor source for the processing of pecan nuts, was a leader in pecan production, increasing its yield from 93,800 pounds in 1899 to 619,886 pounds in 1919. Guadalupe County went from 500 pounds in 1899 to 581,216 pounds in 1919 (Texas Planning Board n.d.h; n.d.i; n.d.k).

Following the Panic of 1893, stabilization did not occur until the turn of the century. At that point, agriculture entered another successful period leading up to World War I in response to favorable weather conditions, and the federal government's push for increased crop and livestock production in support of American and Allied forces. In Texas, the severe drought in 1917 and 1918 hindered the state's ability to contribute large quantities to the war effort; however, record rainfall following the drought significantly increased Texas' crop production to record highs in 1919. The average value of all crops in the study area doubled from 1909 to 1919 in some areas and increased five-fold in Coryell County to \$10,928,349 and a total of 246,011 acres of improved farm land.

Prior to 1910 in Texas, wheat was primarily grown for livestock feed and milling. As a result, production was limited, with the southern seven counties from Travis and Bastrop south to Bexar producing between 2,500 and 100,000 bushels each in 1899. However, with a growing population, crop diversification, war-time needs, and the return of rain in 1919, wheat production in Texas skyrocketed to 36,219,106 bushels, with 10 counties raising more than 800,000 bushels. Coryell County produced 811,000 bushels, the largest in the study area (U.S. Census Bureau; Texas Planning Board n.d.l).

Oats became a leading crop in the state, with farms producing over 63,000,000 bushels in 1919. The northern counties in the study area led in oat production, harvesting between 500,000 and over 1,000,000 bushels in 1919, while the southern counties produced between 50,000 and 500,000 bushels. Bell, Coryell, Falls, McLennan, and Williamson Counties, in particular, dominated oat production in the study area. In 1919, Bell County alone yielded over 2,000,000 bushels while McLennan County produced over 2,500,000 bushels (Texas Planning Board n.d.i).

Like oat production, peanut cultivation until 1909 was largely for home consumption. However, by that date, 1,074,998 pounds of peanuts were produced in the state, and Milam County had the largest crop in the study area with 14,165 pounds. A decade later, the state produced 2,731,632 pounds of peanuts, but production had fallen off in Milam County to 10,553 pounds (Texas Planning Board n.d.j).

Immigrants supplied much-needed labor to harvest record amounts of crops. Many of them emigrated from Mexico, largely to escape that country's revolution between 1910 and 1920. Over 800,000 Mexican immigrants fled to the United States during the Mexican Revolution. Texas had the largest population of

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Mexican-born residents of any state in the country with 71,062 in 1900, more than tripling to 249,652 by 1920. In the study area, the southern counties had the largest concentration of Mexican-born citizens. Bexar County was the leader, with 13,226 in 1910 and 32,934 in 1920. Caldwell County increased from 4,113 in 1910 to 5,900 in 1920, and Hays County jumped from 2,893 in 1910 to 5,169 in 1920. Many became tenant farmers and sharecroppers, although the number of farms operated by tenants in the study area remained virtually unchanged, averaging 2,110 tenant-operated farms in 1910 and 2,325 in 1920 (U.S. Census Bureau).

Increasing agricultural production was accompanied by soil depletion as industrial-scale farming intensified in the twentieth century. Partly in order to combat these effects, as well as to deal with the threat posed by the boll weevil, much agricultural extension work occurred in Texas by 1903. Six years later, the Texas Legislature authorized the Blackland Experiment Station, Substation No. 5 in Temple, Bell County, and scientists began to conduct research on soil and crop topics that were specific to the Blackland region. In 1914, the Texas Agricultural and Mechanical College joined the U.S. Cooperative Extension Service, and county agents associated with the service worked to transfer vital information developed at the college to local agriculturists.

From 1893 to 1920, farms in Central Texas increasingly operated on an industrial scale but otherwise changed very little from farms established in the 1870s, 1880s, and early 1890s. The main differences are evident in the domestic and work zones. In the domestic zone, the architecture of the main house often reflected national trends because kit houses became more popular and affordable due to an expanding rail network. Increased trade from railroads not only enabled locally produced goods to shipped out to new markets, but it also allowed easier transport of building supplies to farms in rural areas. With farming as an established and an increasingly profitable and viable economic endeavor, more residents from other parts of the U.S. and other countries were moving to Texas, bringing with them a familiarity with and preference for national building styles. In the agricultural work zone, farmers built more silos as cotton production decreased and grain and corn production increased. Tenant and sharecropper housing was also still prevalent during this period. Additionally, another change on the landscape was the increased number of pecan orchards, which were mainly located adjacent to creeks and rivers.

DEVELOPMENT PERIOD: 1920 TO 1932

The decade leading up to and including the first few years of the Great Depression was marked by a sharp decrease in crop production due to the boll weevil infestation in 1920 that reduced cotton crop production by 34 percent, a drought in 1925, and the financial crisis at the end of the decade. Despite the advantages of new agricultural technologies, commercial fertilizers, and marketing cooperatives, large numbers of the population left Texas due to their inability to farm and growing economic concerns. The average crop value in the study area decreased by half between 1919 and 1929. In Guadalupe County, the crop value in 1919 was \$8,358,151 and decreased dramatically to only \$2,610,415 in 1929. In addition, from 1924 to 1929 the amount of cropped land in the study area decreased between one and ten percent. By 1929, Hays and Comal Counties experienced over 10

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percent failure of the total crop land in the county. Bexar County had five percent failure while the northern counties experienced approximately one percent crop failure (U.S. Census Bureau).

In the mid-1920s, advances were being made in machinery and agricultural technology that had the potential to favorably impact production. The first self-propelled harvesters were patented and produced. Commercial fertilizers were increasingly marketed to farmers, and the amount used in the country increased from 3,738,300 tons in 1909 to 6,845,800 tons in 1929 (Farm Machinery & Technology 2012). However, most farmers apparently were not inclined or could not afford to invest in these new advances. As a result, harvesting and plowing in Texas and the study area mostly remained horse- or mule-drawn until after World War II (*Figure 4-1*). Therefore, horse and mule barns were still prevalent on Central Texas farms, and remained relatively unchanged from the previous time period. Marketing cooperatives such as the Texas Wheat Growers Association, the Texas Farm Bureau Cotton Association, and the Texas Corn Growers Association also sought to assist farmers in controlling and negotiating prices.



Figure 4-1. Before World War II, the majority of Central Texas farmers used non-mechanized plows. Source: The Portal to Texas History.

Increases in vehicular transportation during the 1920s also provided farmers with an additional method of transporting their crops to market. Following the establishment of the Texas Highway Department (THD) in 1917, an improvement of Texas roads was kick-started in the 1920s. Although small county roads were still rudimentary, several U.S. highways and state highways were graded, paved, and built with concrete and steel bridges that made all-weather vehicular transportation possible. These improvements and the increase in vehicular transportation made truck farming a popular agricultural pursuit in addition to large-

scale crop production. Many farmers grew vegetables and some fruits that could be sold locally and regionally. As a result, food storage buildings and trenches were built in the agricultural work zone. Additionally, vegetable and fruit stands were also built at the edge of farms along the roadside.

The record crop yields that had characterized the 1919 harvest quickly disappeared by the early 1920s. Yields of oats, for example, fell by almost half in 1924 due to the winter drought and decreased again in 1929 due to the collapse of the economy (Texas Planning Board n.d.i). As with oat production, the wheat crop dropped in 1924 and 1929 by more than half. Coryell, McLennan, and Bell Counties, formerly the top wheat-producing counties in the study area, saw their crop yields plummet between 40,000 and 150,000 bushels. Bell, Milam, and Williamson Counties had led the study area in corn production, with each producing over 2,000,000 bushels of corn in 1919, but the drought in 1925 and the collapse in 1929 dropped the yields by more than half (Texas Planning Board n.d.g; n.d.l).

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In 1929, Guadalupe County's pecan harvest dropped to less than one-fifth of its 1919 yield, and Bexar County harvested approximately half of its 1919 production. Peanut production fluctuated during this period, largely due to market demands to which the peanut crop is particularly responsive. The majority of the crop was used by candy factories, roasting plants, and peanut butter and oil manufacturers. Despite these various uses, statewide production of peanuts fell between 1919 and 1924 by 66 percent to 917,799 pounds. (Texas Planning Board n.d.j; n.d.k).

DEVELOPMENT PERIOD: 1932 TO 1945

This developmental period was marked by the intensification of farming education and assistance. A significant number of federal New Deal depression-era programs focused on relief, reform, and recovery, including: the 1933 Agricultural Adjustment Act (AAA) to control surplus production and market prices, the 1937 Farm Security Administration (FSA) to assist sharecroppers, and the Soil Conservation Service (SCS) and the Civilian Conservation Corps (CCC) to assist in reducing soil erosion (History 101; Hendrickson 1974:39). A large part of the AAA agenda included paying farmers not to grow certain crops including cotton on portions of their land. While this measure did stimulate the agricultural economy, it effectively reduced the roles of tenant farmers and sharecroppers. As a result, tenant and sharecropper housing began to disappear in the agricultural work zone. The total number of farms operated by tenants in the study area decreased by almost half from an average of 2,656 per county in 1930 to 1,573 in 1940 (U.S. Census Bureau). The SCS, established in 1935, introduced good farming practices including crop rotation. Some of the practices were implemented in the years before the Great Depression by the Texas Agricultural Extension Service; the SCS sought to further educate farmers on agricultural practices that would conserve the land and increase yields. The efforts by the SCS also focused on terracing and contouring. The CCC completed additional soil conservation efforts during the Great Depression. In fact, President Franklin D. Roosevelt created two arms of the CCC: 1) a branch that was focused on forestry and soil conservation under the Department of Agriculture, and 2) the more widely known branch that built state parks under the Department of the Interior (Hendrickson 1974:39). In Texas, the majority of the CCC's work focused on soil conservation, and together with the SCS the two agencies changed the face of Texas farms through hundreds of soil conservation projects in Texas, including major projects in the study area.

The FSA acted as a loan administrator for sharecropping and tenant families, providing loans for equipment, seed, livestock, and homes. The FSA also provided health care and encouraged sanitary conditions for migrant workers. In Texas, the state's Farm Placement Service assisted farmers in securing labor and also teamed with the FSA to set up labor camps (Acosta 2012).

Despite the economic hardship of the 1930s, advances in agricultural technology and machinery still occurred. Tractors became more commonplace, with rubber tires replacing steel tires, new diesel engines, and a move from two to four cylinders (Ganzel 2012). The spindle cotton picker also was introduced, providing one of the first mechanized cotton harvesters. However, the steel shortage during World War II delayed equipment production until after the war. Commercial fertilizer use rose significantly to a county-average of 13,590,466 tons between 1940 and 1949 (Farm Machinery &

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Technology 2012). Many of the sharecroppers and tenant farmers left the agricultural field and joined the war effort in factory industries in the United States as well as joining the fight with Allied troops abroad. Farms operated by tenants in the study area averaged 2,656 farms per county in 1930 and decreased to 1,573 farms in 1940 (U.S. Census Bureau).

Agricultural exports were 22 percent of the United States' total export amount during the war (Agricultural Trade & Development 2012). By 1934, the counties in the study area were producing over 175,000 bushels of corn a year. However, the introduction of a hybrid grain sorghum variety in the 1940s decreased corn crop yields. Experimentation with corn and sorghum crops revealed that grain sorghum was less susceptible to drought than corn, and sorghum worked as well as corn for livestock feed (Bland n.d.:187). Cotton production during and after World War II also suffered due to the shortage of labor and the increasing use of synthetic fibers. As a result, many counties in the study area shifted away from cotton and toward other grain and livestock production. For example, Williamson County moved toward wheat and sorghum, as well as poultry and livestock. Williamson County's 1929 cotton yield of 68,266 bales dropped to 36,890 bales in 1939. In contrast, Williamson County produced between 50,000 and 150,000 bushels of wheat in 1934 (Odintz 2012; Texas Planning Board n.d.g; n.d.h; n.d.i).

DEVELOPMENT PERIOD: 1945 TO CURRENT

The postwar era of agriculture in the United States and in Texas was characterized by more agricultural technology advances, the introduction of new hybrid crops, and the shift in the size and number of farms. Additionally, the prosperity in the American economy during the post-World War II years and the increase in automobile ownership led to changes in the domestic zone.



Figure 4-2. Widespread ownership and use of tractors and harvesters contributed to the growth and transformation of Texas farms during the post-World War II years. Source: The Portal to Texas History.

In 1954, the number of tractors on farms in the United States exceeded the number of horses or mules for the first time in the country's agricultural history (*Figure 4-2*). Researchers discovered that the chemical anhydrous ammonia increased crop yields while chelates (a type of organic chemical) helped to reduce metal deficiencies in some plants and crops (Farm Machinery & Technology 2012). Mechanical harvesters and increased irrigation contributed to a growth in pecan production. Native and hybrid pecan varieties also were being used, and by 1960, Texas was producing 21 percent of the nation's pecan crop (Evans

2012). New corn and wheat hybrids were increasingly used, and by 1960, 96 percent of corn planted in the United States was a hybrid variety (Farm Machinery & Technology 2012). Counties in the study area continued to shift toward grain production other than corn and oats and to increase their livestock

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production. Comal County yielded only 60,000 bushels of corn, close to ten percent of the yield at its peak in 1919. Oat production dropped from 200,000 in 1919 to only 40,000 in 1969. However, sorghum production increased from 3,958 bushels in 1939 to 250,000 bushels in 1969. Corn and oat yields in other counties in the study area mirrored Comal County's results (Texas Planning Board n.d.g; n.d.i). In Travis County, hay and sorghum represented 60 percent of the county's crops (Smyrl 2012).

The number of farms across the country, Texas, and the study area decreased during this time period. In 1970, there were 1,029 farms in Bastrop County, down from 3,325 in 1920 and 1,858 in 1950. Caldwell County had 819 farms in 1960, a sharp decrease from 3,364 in 1920 and 1,491 in 1950. Although the number of farms decreased, the size of the farms increased. The average farm in McLennan County in the 1930s was 88.7 acres; the acreage increased to 259.3 in the 1960s. In Caldwell County, the average farm was 86 acres in 1930, increasing to 330 acres in 1960 (Marks 2012; Smyrl 2012).



Figure 4-3. The creation of the FM and RM road system turned small dirt roads into paved transportation facilities for Texas farmers. Source: The Portal to Texas History.

Another major impact on farming (as well as dairying and ranching) was the improvement of the vehicular transportation system in the post-World War II years. With the widespread construction of the farm-to-market (FM) and ranch-to-market (RM) road systems from the mid-1940s through 1960s, rural roadways were upgraded into all-weather transportation facilities with all-weather bridges and drainage structures (*Figure 4-3*). The construction of the interstate system in the 1950s and 1960s was another major change in the transport of crops from rural farms to larger markets. Together, the FM/RM road network and interstate system allowed for larger truck

traffic to access rural farms during all weather conditions and transport crops to larger markets cheaper and faster than railroad transportation.

During the post-World War II years, completion of the shift from a rural, agrarian economy to an urban, industrial economy was due, in part, to the many people who sold their farms and moved to urban centers. Resident farmers who stayed often purchased their neighbors' land. The shift also was characterized by agribusiness owners who were divided into two groups: 1) non-resident owners living in cities and farming the land, and 2) large corporations that hired farmers to work the land.

Although there were fewer farms in the post-World War II era, the remaining farms were larger; their circulation networks and appearances changed depending upon who bought them. When resident owners purchased the land, a new main residence often was constructed in the domestic zone, and the

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older main residence was either demolished, left unoccupied, or used for storage. The new main residence was similar to those built in urban environments, with Minimal Traditional houses dominating the landscape immediately following World War II and Ranch-style houses becoming more prominent in the mid-1950s through 1970. Construction of garages in the domestic zone also was widespread during this time as automobile ownership increased.

In the agricultural work zone, large equipment sheds and storage buildings were constructed to house the large and expensive self-propelling combines and other equipment. Horse and mule barns often were demolished, left unused, used as storage buildings, or converted into machine shops. With increased mechanization, sharecroppers and tenants were no longer needed during the postwar years, and their houses became obsolete and were likely demolished to make room for additional crops. In rare cases, they were used as houses for family members or as main houses on farms.

With larger landholdings, the distance between the agricultural work zone and some fields may have been greater than in previous years, and major roadways may have separated fields from each other and from the agricultural work zone. The circulation network on the postwar farm was likely modified to provide more access points to public roads and allow easy access from the agricultural work zone to the fields.

If agribusiness owners bought the land, most, if not all, domestic zone buildings, structures, and landscape features would be demolished and converted into fields. The main structures on the property would be the equipment storage buildings, which often would be located near a road to allow for access to fields that were separated by roadways.

RANCHING TRADITIONS IN THE STUDY AREA

HISTORIC BACKGROUND

This overview provides the basis for understanding the major developmental periods associated with ranching in the 13-county study area. It also describes how significant historical themes, events, and patterns influenced the physical evolution of ranches as an agricultural type. These developmental periods are not to be considered as periods of significance, but instead are defined to note specific cultural landscape patterns directly linked to ranching. This overview considers all types of livestock associated with ranching under a single grouping; however, ranches exhibit distinct physical characteristics that respond to the specific needs of the types of livestock being raised. As with other agricultural activities, those associated with ranching are not always undertaken at the exclusion of other agricultural operations. For example, nineteenth- and twentieth-century ranchers often grew crops on selected fields while maintaining large herds of cattle or other livestock on nearby pastures. The dynamic character of ranching is important to understanding the state's rich agricultural traditions. With a heritage that dates to the founding of Spanish missions during the early eighteenth century, ranching remains a distinct part of Texas culture and identity.

DEVELOPMENT PERIOD: 1718 TO 1836

Spanish missionaries introduced ranching to the region following the establishment of a series of missions along the San Antonio River during the early eighteenth century. The missionaries brought livestock to help the missions and their inhabitants to be independent and self-sustaining. Among the animals introduced to the region were horses, cattle, sheep, and goats. The abundant pastures and fields on nearby lands and reliable sources of water along rivers and creeks provided ideal conditions for the proliferation of livestock such as cattle and horses. Abundant water was particularly important for cattle, which typically drank 7 to 10 percent of their body weight in water each day. As chronicled in Jack Jackson's detailed examination of Spanish ranching in Texas from 1721 to 1821, ranching became a successful endeavor, and the land easily supported the growing numbers of livestock. An inventory in 1762 tallied 5,487 cattle, 560 saddle horses, 15,200 goats and sheep, and at least 1,280 mares among the five Bexar missions established along the San Antonio River (Jackson 1986:36).

The success of the missions in the San Antonio River basin led to the establishment of private ranches along the San Antonio River and other waterways in the region, such as Cibolo Creek and the Guadalupe River. These early ranching efforts, as well as those in South Texas, relied on an open-range system that endured until the fourth quarter of the nineteenth century. Livestock grazed unimpeded on open pastures, and ranchers used branding to identify their livestock. Cattle, horses, sheep, and goats adapted well to their new environs and multiplied in large numbers, extending their range far beyond the Spanish-era ranches.

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After gaining independence from Spain in 1821, Mexico encouraged greater settlement of territory north of the Rio Grande River and awarded a series of expansive *empresario* land grants, mostly to immigrants from the United States. Austin's First Colony in the coastal prairies between the Brazos and Colorado Rivers in present-day Southeast Texas is the most famous. However, grants issued to Sterling C. Robertson and Green DeWitt, as well as a Third Colony granted to Austin, were among those that overlaid the study area.

The Mexican government imposed relatively few restrictions on the *empresarios* or land agents but required that new settlers be Catholic and work to improve the land. The government's settlement policies not only confirmed agriculture as the underpinning of development and colonization, but also influenced settlement patterns and land use. Moreover, these policies acknowledged existing conditions in Texas and actively encouraged colonists to tap the vast potential of livestock that roamed the land. A map of Texas from the 1830s, for example, noted "large droves of wild cattle and horses" over a wide expanse of the territory (Tanner 1836). Such resources provided a readily available means to make a living through ranching. Married heads of families could obtain as much as a *sitio* or league (4,428.4 acres) to raise livestock and a *labor* (ca. 177 acres) to cultivate crops. A *sitio* encompassed sufficient grazing lands to support herds of livestock.

The layout and orientation of these land divisions followed Spanish colonial traditions that relied heavily on geographic factors and water access. They emanated outward from a major waterway that provided a reliable source for water and sufficient lands to raise livestock. The typical configuration of a *sitio* or *labor* featured a rectangular shape set roughly perpendicular to the path of the anchoring waterway. The resulting polygon had three sides with right angles; the fourth side was the meandering of the major waterway. Since most Texas rivers flow in a southeasterly direction, the layout of most land units issued during the Mexican colonial era presented a similar orientation. This land parcel system contrasted sharply to the township-range system, which was adopted in the United States during the late eighteenth century and utilized a uniform, grid-like pattern based on principal meridians. Moreover, the Spanish-based system influenced subsequent patterns of development that affected how the land was used throughout South and Southeast Texas, including much of the 13-county study area.

The establishment of *empresario* colonies between 1821 and 1835 triggered a wave of Anglo Americans into Texas that changed the region's demographics and cultural composition, and ultimately led to independence. Most of the immigrants were farmers who introduced an agrarian-based culture that reflected their heritage but also adopted, to varying degrees, the existing ranching traditions that were already established. They took advantage of the generous land offerings and secured the maximum amount of land being offered. They recognized the advantages and qualities of the East Texas woodlands, and the Coastal and Blackland Prairies with their vast grasslands, and began to raise cattle (Richardson and Hinson 2012). They often brought their own livestock that interbred with native herds. Following Spanish ranching traditions, they relied on open range ranching and branding as a means to maintain and manage their livestock. Others, particularly those cattle raisers who settled in East Texas, brought with them a southern tradition of using whips and dogs to control animals.

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Sheep and goats were two other important kinds of livestock whose origins can be traced to the Spanish Colonial era. Like other domesticated animals, sheep were introduced to land within the study area by Spanish missionaries in the early to mid-eighteenth century. They were valued not only as a food source but also for the wool that was used to produce woven goods. While cattle and horses proliferated on the open ranges, sheep and goats, which provided meat, milk, cheese, and wool, needed more human care and attention. Because of their vulnerability to predators, their numbers decreased substantially by the first quarter of the nineteenth century following the abandonment of the Spanish missions and political instability associated with Mexico's efforts to win independence from Spain in 1821.

The contributions of ranching from this developmental period stem are primarily intangible ones—the successful introduction of livestock and land-use patterns rather than from the physical remains of ranches and associated resources from the period. In fact, few tangible vestiges of Spanish and Mexican Colonial-era ranches are extant today, and archeological investigations are a more likely means of identifying, understanding, and evaluating the material culture associated with these ranching activities. Nonetheless, the significance of land divisions and land-use patterns established during this era continues to be seen on the landscape, albeit in a less obvious and subtle manner than a still-operational ranch. The shape and orientation of land parcels and the viability of raising livestock as a livelihood continue to be driving forces within the cultural landscape of the study area. The kinds of historic resources that may survive from the era include ranch houses, small and large corrals, slaughterhouses, and hand-dug wells in fields with shallow water tables that provided alternate water sources in areas removed from constantly flowing rivers and creeks.

DEVELOPMENT PERIOD: 1836 TO 1874

Following independence from Mexico, the Republic of Texas adopted a generous land-grant policy to encourage greater settlement in the cash-strapped but land-rich nation. The Republic issued its own series of land grants, including many in the study area that attracted investors and settlers from the United States and Europe. Many of the pioneers who moved to Texas and particularly the study area beginning in the 1830s came from the Upland and Lowland South. In addition, the activities of the German *Adelsverein* promoted German immigration to Texas, and resulted in settlement by that ethnic group in coastal counties and much of the Hill Country (Bieseke 2012; Brister 2012). Germans were among the many groups who moved to Texas during its brief tenure as an independent nation, and the flow of immigrants to Texas increased after annexation into the United States in 1845.

With limited resources, a crude transportation network, and little or no knowledge of the land and its climate, these immigrants began to tap the region's agricultural potential. The cultivation of corn, oats, wheat, and other crops for their own use and consumption was the greatest priority, but high prices and growing demands for cotton provided strong financial incentives to grow that cash crop. In addition, the large herds of wild cattle and horses on the expansive prairies throughout much of the study area offered still other opportunities. Clara Stearns Scarbrough wrote in her history of Williamson County that, "if the number of cattle brands registered with the County Clerk in the 1850s and afterwards is any indication, almost every man in the county could have been classified as a stockman" (Scarbrough

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1973:200). Frederick Law Olmsted noted settlement patterns in another part of the study area that underscored the importance of ranching during the early years of statehood. While recounting a trip from Seguin to Gonzales in *Journey through Texas*, chronicling his travels in the state, he noted that “the banks of the [Guadalupe] River, on both sides, are considered to be well settled. The houses of the residents are, perhaps, a mile apart on the more valuable parts. On the east side are some families who came here before the Revolution. Most of the settlers are extensive herdsmen and small planters” (Olmsted 1857:234). Ranching during this time period continued to rely on open-range methods established years earlier by the Spanish, and stockmen used trails to drive their cattle to New Orleans and other markets to the east and north. Beginning in the 1840s, herds were driven through the Blackland Prairie region on the Shawnee Trail to Missouri, and in 1846, one individual drove a large herd of cattle to Missouri.

These pioneers recognized the inherent qualities of the land, but it still took years of experimentation, patience, and determination to realize the region’s true potential to raise livestock. William Walton Haupt of Hays County adopted such an approach, and he went on to play a pivotal role in the history of goat ranching not only in the study area but also in Texas and the nation. A native of Alabama, Haupt moved to Texas in 1848 and initially established a farm on the Colorado River west of Bastrop. Like many early pioneers, he cultivated cotton and also raised horses. After visiting nearby Hays County, he reportedly became “fascinated with its rich grassy prairies and its low, undulating gravelly smooth ridges with abundance of cedar and other growth” (Barnett 1987:354-355). In 1857, he acquired a large tract of land along the Balcones Escarpment near the small community of Mountain City, between Kyle and Buda. He purchased eight Angora goats from a breeder in Georgia and began to develop his own high-quality herd by crossbreeding Angoras with the “common Mexican goat” (Carman, et al 1892:913). Others soon followed including Joseph P. Devine, who established a 12,000-acre ranch 15 miles north of San Antonio in Bexar County (Barnett 1987:357). The successful endeavors of these early Angora goat ranchers eventually spread, and as one historian has noted, “mohair production intensified along the Balcones Escarpment where steep canyons offered brushy vegetation, water, and protection from the elements” (Barnett 1987:358).

Whereas goats brought by the Spanish were valued primarily for their meat and milk, Angora goats provided another agricultural commodity—mohair—that gained significance over time. A silk-like fiber, mohair was used in clothing, draperies, rugs, carpets, and furniture upholstery. During the mid- and late nineteenth century, demands for mohair increased because of its popularity in the use as plush for railroad cars (Zimmerman 1910:17).

Another pioneer in the history of ranching in Texas—George Wilkins Kendall—is directly linked to the study area. Regarded as the father of improved sheep breeding in Texas, Kendall first began raising sheep in Comal County in 1856. By the time he moved to the region, he was already a well-known travel journalist and war correspondent. After extensive travels in the American West and in Europe, he eventually settled in Comal County and established a sheep ranch about five miles north of New Braunfels. Frederick Law Olmsted wrote about his meeting with Kendall and noted that he “has a good

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Figure 4-4. A Sheep Ranch in Edwards County, 1913. Although outside the study area, this ranch illustrates the kinds of resources associated with sheep ranching in Texas during the early twentieth century. Source: Kocher, 1915.

stock of mares, some cattle, and a large flock of sheep” (Olmsted 1857:183). Kendall moved to the Boerne area a year later, and Kendall County was named in his honor.

The expansion of sheep and goat ranching in the study area grew relatively slowly during the middle of the nineteenth century. Continued raids, primarily by members of the Comanche and Kiowa tribes, hampered permanent settlement in areas best suited to raise such animals. In addition, sheep and goat ranching required a significantly higher level of human management and oversight than horse or cattle ranching. These needs

included the use of fences, pens, and sheds to control and maintain herds (Figure 4-4); the construction of such improvements was labor intensive.

After the Civil War, increased demands for meat contributed to a rapid expansion of the cattle industry in Texas. Cattle ranchers, eager to exploit this opportunity, resumed drives over trails established before the war. The earlier Shawnee Trail, for example, became known as the Chisholm Trail, which was among the most significant and famous routes used for cattle drives (Figure 4-5); it was east of the Balcones



Figure 4-5. Cattle Trails in Texas. Courtesy of the University of Texas Libraries, The University of Texas at Austin.

Escarpment. The Chisholm and other trails extended through the fertile grasslands of the Blackland Prairies where pastures and rivers and creeks provided good sources of food and water. While being driven along the paths, the herds often traversed through the lands and cultivated fields of the growing number of farmers who settled in the region. Such occurrences and the practice of open-range ranching caused conflict and hostilities between farmers and trail drivers that continued until the availability of rail transport made trail drives obsolete.

Some of the more successful ranchers in the study area attained great wealth and constructed grand houses as symbols of their prosperity. The Georgetown area, for

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example, boasted several opulent two- and three-story Italianate houses including the John Tinnin House (Scarborough 1973:214). The grandeur and scale of these dwellings contrasted to those built during the early years of settlement, when most early ranchers constructed simple houses from readily available materials. Few have survived over time.

Fences were another landscape element of the era and were used to control and manage livestock. Many ranchers used stone to construct pens or corrals. Such labor-intensive, man-made features typically were built near the main house, and were more typically associated with ranches and farms in the Hill Country region. A more common fence material was vertically placed raw or roughly hewn timber or upright cedar posts in a palisade configuration. Hand-dug wells and cisterns provided water for human and animal consumption. Ancillary structures (sheds and barns) were small and utilitarian in appearance and form.

DEVELOPMENT PERIOD: 1874 TO 1918

By 1874, cattle ranching had become a highly profitable business that represented a significant part of the economy of the study area. The vast and open pastures provided ideal conditions for raising cattle, and the development of trails for cattle drives enabled ranchers to enjoy considerable profits. However, the invention of barbed wire in 1874 proved to be a pivotal event in the history of ranching in Texas, and it played a primary role in the demise of open-range ranching during the final quarter of the nineteenth century. Other factors also played important roles in the evolution of the industry, including the introduction of purebred stock, expanding railroad network, the dramatic rise of the Blackland Prairie as the state's leading producer of cotton, and quarantines placed on Texas cattle by other states.

The adoption of barbed-wire fencing had a lasting effect that permanently changed land-use patterns and the cultural landscape associated with ranching. Farmers, who had long confronted ranchers about their herds that traversed through cultivated fields, finally had an effective method of protecting their land from livestock. With greater stability and control of their property, farmers prospered, which contributed to a greater influx of people eager to tap the fertile soils of the Blackland Prairies. Increasingly, these farmers cleared, plowed, and expanded their fields and grew a variety of crops, most notably cotton, during the late nineteenth and early twentieth centuries. Rising land prices exerted financial pressures on ranchers, who relied on cheap property values and favorable leases for grazing. Such trends greatly diminished the cattle and horse herds that had previously been so prevalent in areas east of the Balcones Escarpment. A U.S. Department of Agriculture report in 1892 noted this trend, observing that "the price of land is advancing and an increased area is being used for farming purposes" (Carman, et al 1892:903). Many ranchers moved their herds to newly available grasslands in other parts of the state after successful campaigns by U.S. Army cavalry forces defeated the remaining defiant members of Comanche, Kiowa, and other Southern Plains tribes during the mid-1870s. Although cattle ranching continued to be important in the study area, it did not represent such a dominating part of the agricultural-based economy until the mid-twentieth century.

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The types of fences pre-dating barbed wire were largely ineffective or too labor intensive to be used on a widespread basis. The inclusion of barbs in the metal wiring was an efficient and cost-effective method to control livestock. Although the first sales of barbed wire occurred in 1875, a demonstration of its use in Alamo Plaza in San Antonio a year later proved to be the catalyst for its use in Texas (McCallum and Owens 2012). Attached to cedar or other types of wooden posts driven into the ground, barbed wire could be stretched across large distances. Barbed-wire fences typically outlined the parameters of a parcel of land but also enabled ranchers to manage their land and to segregate and control their herds for selective breeding.

Still another consequence of barbed-wire fencing was the decline of Texas Longhorns as the mainstay of the state's still-expanding cattle industry. The evolution of Longhorn cattle as a distinct breed has long been subject to debate among historians and others. They are usually regarded as a cross between the free-roaming cattle introduced to the Texas landscape by the Spanish in the eighteenth century and English-based breeds brought by Anglo Americans during the Mexican Colonial period and the early years of the Republic of Texas (Worcester 2012). The ability to survive on the open prairies with minimal human interaction allowed them to proliferate. Their hardiness and durability enabled them to adapt to the harshness of the environment. Ranchers, eager to capitalize on growing meat demands during the late nineteenth century, imported improved and purebred livestock, such as shorthorn Durhams and Herefords, and used barbed wire for stock management. Over time, Texas ranchers created new crossbreeds that provided larger quantities of better-quality meat, and hence, more profits. Breeding methods created by the use of barbed-wire fencing changed the face of, and laid the foundation for, modern ranching.

The expanding rail network began to transform the economic underpinnings of Texas during the final quarter of the nineteenth century, as the rail system's long-recognized potential of increased commerce and trade began to be realized. Within the ranching community, railroads provided an alternate and more cost-effective means of transporting Texas cattle and other livestock to eastern and northern markets. Railroads brought greater stability and predictability to the cattle ranching industry because transportation by rail cars eliminated the kinds of losses that occurred on cattle drives. Rail

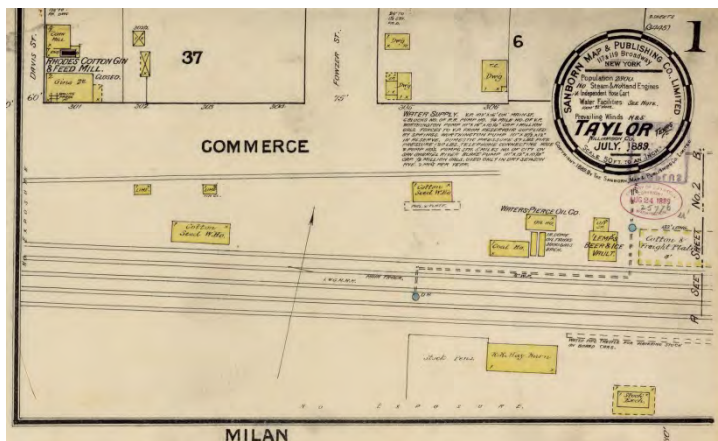


Figure 4-6. Detail of Sanborn Fire Insurance Map of Taylor, 1889. Courtesy of the University of Texas Libraries, The University of Texas at Austin.

transportation also enabled goat and sheep ranchers to ship mohair and wool to regional warehouses and then to ports and distant markets. Stock pens adjacent to railroad tracks became destinations for area ranchers who took livestock to be loaded into cars and shipped to slaughter houses. A clear example of this trend occurred in Taylor, where an 1889 Sanborn map depicts a stock pen adjacent to the International and Great Northern Railway tracks. The stock pen was in an

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area of the city containing other agricultural-related structures including a cotton gin and feed mill, as well as two cottonseed warehouses and a cotton platform to load bales (*Figure 4-6*). Together, these resources reflected the diversity of local agricultural production and demonstrated the continued importance of ranching to the area (Sanborn Map & Publishing Co. 1889:2). None of these structures in Taylor are extant.

With the end of open-range ranching, water accessibility became an even greater concern, as livestock could no longer roam unimpeded on fields and pastures to get water. Periodic droughts had always plagued the region and affected all agricultural pursuits including ranching. Fenced pastures made major rivers and creeks inaccessible to livestock owned by many ranchers with less reliable water sources. To mitigate such factors, ranchers (and farmers) embraced innovations in windmill production, as well as improved well-drilling technology as alternate means of securing water. The expanding railroad network contributed to the widespread use of wind-powered and well-drilling equipment that could pump underground water to the surface for livestock. Windmills of the late nineteenth century utilized all-wood construction, but mass-produced metal turbines and metal-frame stands shipped by rail became the norm in later years. The use of windmills opened new lands for ranching, especially in areas west of



Figure 4-7. Ranch in Texas, location and date unknown. Source: The Portal on Texas History.

the Balcones Escarpment, which experienced a rapid rise in sheep and goat ranching. On existing ranches, these features also made more remote areas lacking good water sources available for grazing. Windmills and associated concrete or metal tanks and earthen ponds became common on the landscape during the late nineteenth and early twentieth centuries (*Figure 4-7*). They also were frequently built adjacent to farm and ranch headquarters and provided water for human consumption.

Railroads helped to improve the quality of the buildings and structures constructed on all types of ranches. The availability of milled lumber enabled ranchers to build larger and more highly styled houses that broke from vernacular and folk traditions that had prevailed throughout the pre-railroad era. Instead, they began using pattern books that led to the dissemination of popular architectural forms. Vernacular and folk building traditions still endured but often included applied machine-made architectural detailing. However, new domestic forms featured different room arrangements that broke from older traditions. Other ancillary buildings and structures on ranches increasingly used milled lumber but typically were utilitarian in design, form, and appearance to support intended functions. Examples include all types of barns and sheds. Many of these support buildings utilized pole or board-and-batten construction that was relatively inexpensive and easy to build. Ranchers used milled lumber to construct corrals, pens, chutes, and other structures to manage and control livestock.

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Still another aspect of the railroad and its impact on ranching stemmed from the vast land holdings of railroad companies. To spur railroad development in Texas, the state government conveyed large tracts of public-owned land to railroad companies as an incentive for capital investment in the state. The railroads could either sell the land for a profit or lease the property, oftentimes to ranchers who would use the unimproved fields and pastures for grazing purposes. The ability of ranchers to lease and purchase land from the railroads further expanded ranching activities during the late nineteenth century and helped to finance the railroad industry in Texas.

This period also witnessed the development of other distinctive types of structures associated with sheep and goat ranching. An 1892 assessment of the country's sheep industry examined sheep ranching activities in Central Texas at the time. The report described a building type that sheep herders constructed to provide shelter for their flock, noting that "it generally consists of a shed open to the south, well covered with boards, and usually located on the south side of timber or slope. Some of the flock masters have provided span-roofed sheds, barn shaped, which are well ventilated and can be closed up, so that perfect protection is insured against the most severe storms which may occur in winter" (Carman, et al 1892:902). In addition, the introduction of mesh-wire fencing became an effective deterrent to predators as well as a way of controlling flocks. This new type of fencing utilized woven wire with six-inch mesh stretched between cedar posts and stood 42 to 52 inches in height. These fences typically included barbed wire along the ground and up to three strands above the woven wire as a deterrent to wolves and other predators. The mesh-wire fences proved to be quite successful and contributed greatly to profits and yields of sheep ranchers (Carlson 2012).

Scientific research of "Texas Fever" during the late nineteenth and early twentieth centuries led to the construction of yet another resource type associated with ranching: dipping vats. "Texas Fever" became a problem during the antebellum years, and led to quarantines and restrictions being placed on Texas cattle. Resumption of cattle drives north after the Civil War brought spread of the disease by means of ticks that carried a parasite. While Texas cattle had developed their own immunities to the parasite, animals in other parts of the country remained vulnerable. Development of a dipping vat by Robert Kleberg of the King Ranch in 1891 resulted in a halt to the spread of the disease in Texas. The dipping vat was a structure that allowed cattle to be covered with a pesticide that killed ticks that spread the disease. Experiments on the King Ranch proved successful, and ranchers and government officials promoted the use of dipping vats. By the early twentieth century, dipping vats had become common features on ranches in Texas and other cattle-producing states. Dipping vats typically were used in conjunction with other structures as a way to manage the livestock. The livestock would be driven from a corral into a narrow wooden chute and then into the dipping vat. With an elongated configuration, the dipping vat was dug into the ground below grade and typically was of concrete construction. After being dipped in the pesticide, the cattle would exit to a concrete drip pad and then enter into a separate corral. Henry F. Wurzbach, who owned a large ranch in the vicinity of the county line between Bexar and Medina Counties, was a pioneer in demonstrating the effectiveness of dipping vats within the study area and informed fellow ranchers of advantages of such structures (HHM 2006:5).

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While ranching enjoyed rapid growth during the last quarter of the nineteenth century, it also experienced and overcame multiple hardships and obstacles, some of which were the result of natural causes and others of which were man-made. Devastating freezes and extended periods of drought in the mid-1880s and early 1890s reduced all livestock herds (Lowry 1959). In addition, the Panic of 1893 led to a reduction in livestock prices and bankruptcy for many ranchers with large land holdings. Many of these large ranches were subsequently subdivided and sold to smaller operators and to people interested in farming.

Ranching remained an important livelihood within the study area during the early twentieth century but the number of cattle raised in the study area declined during the first decades of the twentieth century. Williamson County, one the study area's largest cattle producers at turn of the last century, witnessed a drop of almost 40 percent between 1900 (52,227) and 1910 (32,434). Other counties in the study area had less dramatic decreases and averaged reductions at about 22.8 percent. The lone exception to the trend was Milam County, where ranchers experienced only a 6.9 percent drop in their cattle population (Texas Planning Board n.d.c). Increased cotton cultivation may have been a reason for this trend, as acreage devoted to cotton swelled, especially in counties with large amounts of land within the Blackland Prairies.

Texas wool and mohair production rose dramatically during this period, and much of this growth occurred in the Edwards Plateau region. Large numbers of goats and sheep continued to be raised in the study area, but mostly on lands west of the Balcones Escarpment. Agricultural production totals for 1910 note that Bexar, Williamson, Comal, and Hays Counties each contained over 4,000 goats (Bexar, the leading producer in the study area, had 6,651 goats), while Falls, Bastrop, and Guadalupe Counties each had less than 700 goats; 615, 489, and 349, respectively. The leading producers had large amounts of land west of the Balcones Escarpment, while the counties with the smallest numbers of goats were entirely east of the Escarpment. A similar trend occurred with sheep production; however, the disparities were far greater. Coryell, McLennan, and Williamson Counties were the leading counties in sheep production, with 26,427, 18,465, and 15,599 sheep, respectively. In sharp contrast, Bastrop County produced only 43 sheep and nearby Guadalupe and Caldwell Counties yielded 160 and 334 sheep, respectively (Texas Planning Board n.d.d).

DEVELOPMENT PERIOD: 1918 TO 1945

This period marks the next major developmental phase of ranching within the study area. The dates used to define this period stem primarily from the profound changes that occurred within the history of the nation and world rather than from specific events or trends associated with ranching in the study area. Well-established trends in land use and agricultural production provided the foundation for continued growth in the raising of livestock and improvements in the quality of ranching-related products. However, new transportation systems, external economic forces, and the expanded role of government changed the dynamics of ranching as well as other agricultural pursuits. In turn, these changes affected the cultural landscape and the physical evolution of ranches as an agricultural type.

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The widespread use of automobiles, trucks, and tractors presented new opportunities and challenges for ranchers. The proliferation of affordable, mass-produced vehicles helped ranchers and farmers increase their profits and continue to expand and improve their operations. Trucks and tractors could be used to haul materials and goods to and from markets as well as bring hay and feed to grazing livestock in pastures. Horses remained a prominent part of the day-to-day operations of ranches, but tractors and other gasoline-powered equipment changed the dynamics and introduced new building types to ranches. While barns, stables, and related buildings continued to be used, ranchers also constructed garages, shops, and equipment sheds to maintain, service, and store these vehicles. Garages, specifically built for automobiles for personal use, likewise became a common building type on ranches and typically were built near the main house.

With the growing number of vehicles throughout the country, demands for better and more reliable roads led to the construction of better roadways, and the study area was no exception. The resulting highway network made ranches far less isolated and led to frequent trips to nearby communities and local centers of trade. Families purchased consumer goods from retail stores for their homes, and they acquired agricultural supplies and equipment to support their ranching operations. At a micro level, the use of trucks also changed activity patterns within ranches and affected the associated landscape. To supplement the diets of livestock that grazed on grass, brush, or weeds, for example, ranchers increasingly used trucks to distribute hay and supplemental feed to the animals in the fields and pastures. This practice resulted in the development of internal road networks that enabled ranchers to drive to most of their land. Although horses continued to be used to herd and reach areas with more rugged terrain, trucks offered the ability to haul heavy loads over long distances in less time. In addition, they enabled ranchers to service and maintain equipment and fences more efficiently.

Another effect of increasing numbers of automobiles and improved roads was the increasing accessibility of rural properties. At the same time that some long-term ranchers lost their properties to the effects of drought and economic depression, an entire new category of recreational ranchers appeared. Many of them were beneficiaries of the great oil booms of the 1920s and 1930s and had access to ready cash. Attracted especially to the scenic land west of the Balcones Escarpment, they bought distressed ranches and adapted them for recreational ranching use. In some cases, the new owners used the existing buildings and improved them. In other cases, they built new improvements, some designed by professional architects.

Still another effect of the growing use of trucks and tractors on ranches was the proliferation of cattle guards at entrances into ranches from public roads and highways. With a series of metal poles spaced over an open pit, cattle guards proved to be effective tool to control hooved livestock and reduced the need for gates to separate fields. Cattle guards enabled ranchers to drive their vehicles unimpeded between separate fence-lined pastures. The history of cattle guards can be traced back over 2,000 years ago, but the design evolved in the early twentieth century to deal specifically with the use of gasoline-powered vehicles. Cattle guards became popular in the decades after World War I as automobiles,

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trucks, and tractors became more affordable. Typically, they were made from purchased materials and welded on site by ranch hands (Hoy 2012).

Continued use of fencing contributed to the ability to control and manage both livestock and the land. For example, sheep ranchers often set aside or designated separate fields for winter and summer grazing, allowing pastures time for re-vegetation. Such a practice no doubt helped to control erosion and support land conservation efforts. The use of separate fields also allowed ranchers to separate herds to minimize risks of exposure to infectious diseases and improve the quality of their livestock through selective breeding.

Ranchers had long recognized the benefits of providing cotton seed, corn, and other crops as supplemental feed to their herds. During the post-World War I era, sorghum became a particularly popular addition to the diets of livestock throughout the study area. Barns, sheds, and silos provided a means of storing and protecting hay and other dietary supplements, but ranchers also erected larger and better-built structures that often replaced or augmented open-air silage as a means of providing additional feed to livestock. Silos from the period, for example, typically were built on site utilizing concrete and hollow-clay-tile construction. In the postwar era, prefabricated silos and buildings of metal construction were transported by truck and placed on site.

The Great Depression and extended years of drought during the 1930s greatly affected all aspects of agriculture, including ranching. The resulting economic hardships triggered a dramatic shift in the role that government played under the New Deal policies of President Franklin D. Roosevelt. In an effort to boost sagging meat prices, for example, the government embarked on a controversial program, the cattle shoot, that bought and killed cattle and sheep. Other programs included soil conservation efforts aimed to inform farmers and ranchers about measures they could undertake to fight erosion and improve drainage. Farmers and ranchers remained resilient despite such adversities and adapted as best they could to existing conditions. One Williamson County historian noted that, “as cotton production was reduced, the cattle industry again crept eastward in the county. Farmers discovered that their rich black land would sustain many more head of cattle per acre than the less fertile and dryer soils to the west” (Scarborough 1973:360).

The growth of the cattle industry during the period was directly related to the collapse of cotton and to government policies intended to discourage cotton production. Agricultural statistics from the period provide dramatic evidence of these trends. The four counties that experienced the most dramatic cattle increases between 1930 and 1935 were Milam (37.5 percent), Bastrop (26.4 percent), Guadalupe (24.5 percent), and Falls (22.5 percent). All had been major cotton producers during the late nineteenth and early twentieth centuries. In contrast, those counties that had traditionally been large cattle producers experienced much more modest growth. Totals for Bexar, Williamson, Travis, and Coryell Counties had increases ranging from 7.1 percent to 11.4 percent (Texas Planning Board n.d.c).

Rural electrification efforts from the New Deal era provided a new source of power for ranchers and farmers throughout the study area. The construction of a series of dams along the Colorado River and

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affiliated hydroelectric generating plants in the late 1930s produced electricity that could be conveyed to homes in more remote locations through transmission lines. Electrical power enabled families in rural areas to enjoy many modern conveniences that many in cities already were experiencing, and it also supported ranching operations because it powered machinery, lights, and equipment. Rural electrification expanded on an already existing network of transmission lines, but had a different effect on the landscape. Telephone lines from the early twentieth century extended along many rural roadways and featured short branch extensions that led directly to residences. In contrast, electrical lines often took a more direct route across ranches and farms, ignoring existing highways and roads because of the physics of electricity and the inevitable loss of power over distance. New technologies and improved designs in the postwar era led to the introduction of larger and more high-powered overhead transmission lines and the distribution of electricity to more rural locales.

During World War II, actions by the federal government continued to affect ranching in the study area. The War Department announced plans to create a large army base near Killeen in Coryell County soon after the attack on Pearl Harbor. Named in honor of John Bell Hood, a famous military officer from Texas, the post became the home of the Tank Destroyer Tactical and Firing Center and contributed to the war effort. Its rapid construction in 1942 on over 108,000 acres of land forced the displacement of a large number of ranchers and farmers in southern Coryell and northwestern Bell Counties (Briuer 2012). The Army also constructed the Bluebonnet Ordnance Plant on 18,000 acres of former ranch land near McGregor in McLennan County (Smith 2012). These and a few other military installations, such as Bergstrom Army Air Field (later Bergstrom Air Force Base) outside of Austin and Camp Swift in Bastrop County, disrupted ranching and farming patterns in selected parts in the study area on newly acquired government land and on some adjoining parcels that supported military-related activities with new commercial and residential developments. While these operations reduced the amount of ranch land, they also afforded new employment opportunities for area residents and contributed to a decline in agricultural-related jobs that continued into the postwar era.

Ranchers also contributed to the war effort by providing meat and supplies to both civilian and military populations, causing cattle production within the study area to soar. Between 1935 and 1945, for example, the 13 counties increased their cattle totals by an average of 53.8 percent. Bexar County remained the leading cattle producer, and was the location of 80,821 head of cattle by 1945, according to agricultural schedules of the U.S. Census. The only area that did not experience a rise in cattle production was Coryell County, home to Fort Hood. Cattle production actually decreased modestly by dropping from 27,703 in 1935 to 27,615 in 1945 (U.S. Census of Agriculture 1950).

Sheep and goat ranchers also prospered as the demand for durable woolen material, triggered by the need to provide clothing and uniforms for military personnel, increased demands for wool and mohair. Government policies also stabilized prices and insulated ranchers from fluctuation in prices due to varying market conditions. The Edwards Plateau region farther west remained the center of Texas' sheep and goat ranching operations, although Hays, Travis, Williamson, Comal, Bexar, and Bell Counties continued to raise large numbers of goats and sheep. With a sheep population of 81,027, Coryell County

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was the leading producer of this livestock in the study area in 1945. Hays County goat ranchers led all other counties in the study area with 54,064 in 1945 (U.S. Census of Agriculture 1950). As before, the differences in goat and sheep populations on either side of the Balcones Escarpment remained significant.

DEVELOPMENT PERIOD: 1945 TO CURRENT

Many of the forces that historically had influenced ranching-related activities in the study area remained in place following World War II. An existing ranching culture survived virtually intact based on well-established practices and infrastructure. Many ranchers who had ably served and defended the nation returned home to their families who, likewise, had made their own contributions to the war effort and desired to resume their lives as before. Having survived a stagnated economy during the protracted Great Depression and making great sacrifices during World War II, the nation was poised for growth and rebounded with a renewed sense of purpose and optimism. A rapidly expanding economy in the postwar era increased demands for a variety of foods, goods, and services, and the ranchers within the study area and the rest of the state and nation played their part in the era's unprecedented success.

New agricultural trends emerged and some older practices assumed greater significance, which changed the character of ranching from that of the pre-World War II era. Government-sponsored soil conservation efforts, for example, had begun in the 1930s, but the continuation of this service expanded after the war and led to the construction of many small reservoirs in rural areas. Intended to fight erosion and provide flood control, they also provided a source of water for grazing livestock and proved to be an added benefit to ranchers.

Another innovation of the modern era was the wide spread use of electric fences as a means to control cattle and other livestock; however, its first recorded use in Texas took place decades earlier. According to historian J. Evetts Haley, the famous XIT Ranch in the Texas Panhandle used an electric fence as part of an ambitious and innovative fence/telephone system that provided both a means to control livestock and enabled ranch hands the ability to communicate directly with the ranch headquarters over long distances. A number of problems plagued the system and it ultimately proved to be impractical (Haley 1929:168). By the postwar era, electric fences became a common feature on ranches and other agricultural landscapes within the study area and elsewhere in the state and nation.

A demographic shift also occurred during the postwar era, as many former rural residents continued to move in greater numbers to urban areas seeking better jobs and wages. This trend had begun during World War II but increased after the conflict. Increased mechanization in crop production both offset and contributed to this trend. The resulting decline of tenant farming led to abandonment of cotton fields throughout the study area. While some fields continued to be used to cultivate cotton and other crops through the use of new, more efficient and powerful equipment, some land owners allowed their property to revert to pasture lands and raised livestock. In addition, soil depletion and advances in irrigation techniques resulted in a shift of the center of cotton production from the Blackland Prairie to West Texas by this time.

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Despite the effects of periodic droughts, especially during the early to mid-1950s, and continued urbanization, many ranchers in the study area prospered during this developmental period. Rising incomes and profits through advanced ranching practices, continued crossbreeding, and increased demands for ranching-related products spurred ranchers to continue to undertake innovative measures and improve their livestock. As a result, many of those engaged in ranching enjoyed greater affluence that ushered in a wave of new construction. Ranch style and other common mid-century domestic forms replaced older houses that were either kept as secondary dwellings, demolished, or re-purposed. Another trend of the period included the use of pre-manufactured metal buildings and silos, which provided a better, low-maintenance means of storing materials and equipment as well as grain and other feeds. Transported by trailer truck in whole or assembled on site, these structures introduced new forms and materials that contrasted to the wood-frame and masonry buildings that had otherwise prevailed.

An expanding population in cities throughout the study area led to the continuation of the tradition of recreational ranches of the 1920s and 1930s. In the postwar period, some of these ranches typically were much smaller than working ranches; others were quite sizeable. Owners commuted to these recreational ranches on a regular basis and often leased their land to active ranchers. Hunting leases provided another means to supplement ranching incomes, although such activities were more seasonal. Hunting leases contributed to the introduction of a new grouping of ranch buildings including deer blinds, stands, and feeders.

In the modern era, ranching has remained important within the study area but its role within the overall regional economy has waned. The rise of new technologies, manufacturing, and services along with a business-friendly work environment are among the many factors that have seen the population of the Central Texas region rise dramatically. This growth has led to a period of unprecedented development that has spread to rural areas surrounding the region's major cities. Rising property values and suburban sprawl now have become a major threat to many areas that historically have been used for agricultural purposes since the pioneer era of the early to mid-nineteenth century. The construction of new roads and other infrastructure likewise have affected the character of ranching in the study area.

To address the influx of residents to the region, developers and real estate speculators have acquired former ranches near urban centers to create new neighborhoods, shopping centers, and schools within master-planned communities of varying sizes and scales. While completely removing any physical or tangible links to past land use, these developers often have evoked the ranching heritage of the area for their marketing campaigns by using the ranching-related themes for the name of the development or streets. In rare instances, some developers feature a structural element or landscape feature that would function as a marketing tool to identify and distinguish theirs from adjoining developments. Typically, however, such elements are recreations and present a false historicism while still acknowledging the importance of ranching to the identity and culture of Central Texas.

DAIRYING TRADITIONS IN THE STUDY AREA

HISTORIC BACKGROUND

The dairy industry historically has been the source of the largest cash income in American agriculture. It encompasses activities associated with dairy farming, farm-based milk production and distribution, and factory-based production of milk-based food such as cheese and butter. For the purposes of this part of the historic context chapter, the focus is on dairies or dairy farms, which are defined by Thomas, et al. (1949: 284) as “any place or premises where one or more cows are kept, a part or all of the milk or milk products from which is sold or offered for sale.”

Dairy farming is an activity that has occurred throughout the United States and within every state and country. Because the product (milk) is highly susceptible to contamination, its producers, regardless of location, have been subject to local, state, and federal legislation for the purpose of protecting public health. Other broad topics that have been associated with the industry throughout its history have included inventions and technology (development of the cream separator, the Babcock test, well drilling, rural electrification, development of artificial insemination), changes in broad agricultural trends (emphasis on diversified farming and de-emphasis of monoculture, improvement of breeding and genetics), the formation of cooperative associations, the rise of large urban populations, and the development of transportation infrastructure. All of these topics and trends have had impacts on the number and locations of dairy farms and on their physical facilities.

While dairies and dairy producers throughout the United States share certain characteristics, practices, and types of physical facilities, they differ from one another by region and even by state. Historically, the center of fluid milk production has been located in the Midwest. The southern states, including Texas, have lagged in production, despite the fact that the climate and availability of water and forage should encourage dairying. According to Thomas et al. (1949: 17), until the 1930s the South focused on cotton and tobacco production to the exclusion of many other forms of agriculture. A change to diversified farming, of which dairying was a part, was not easy for most Southern agriculturists. Few were inclined to practice the day-in and day-out activities associated with productive dairy farming. In addition, consumption of milk products lagged in the South, dampening market demand and, thus, production.

Despite these drawbacks, dairying in the South generally and Texas specifically was a major source of farm income in the twentieth century and continues to be in the twenty-first. The Central Texas region was one of the centers of the dairy industry in Texas during the twentieth century due to its calcium-rich Blackland soils, abundant water, relatively well-developed transportation systems, large urban centers, access to assistance from county agents, and resident populations of particular ethnic groups who might be more inclined to the discipline of dairy farming (Swedes and Germans).

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DEVELOPMENT PERIOD: 1867 TO 1900

Statistics for the population of dairy cattle in Texas during much of the nineteenth century are inexact because of data collecting and reporting methods. However, because dairy cattle in small numbers were a necessary part of the farm landscape in support of farm families, their population increased from approximately 575,000 in 1867 to 800,000 in 1900 (Buechel 1942: Table 79).³ For the most part, fluid milk production during this time was a subsistence-level activity, and the few creameries that were established in the 1880s failed (Odom 1996:473). It is likely that, until the late nineteenth century, subsistence-level dairy farms would have appeared much like any agricultural operation that focused on the raising of crops or meat animals. It is unlikely that there would have been buildings in the agricultural work zone that were focused exclusively on the care of dairy cattle and the collection and care of raw milk products. Exceptions to the rule appear to have been located in close proximity to urban centers such as San Antonio, where James Milton Vance established the Hillside Dairy Ranch five miles north of the city in the late nineteenth century. Vance's operation "became a show place and was extensively written about in Texas farm papers before 1900" (Gillespie 2012).

Vance is credited with introducing the DeLaval cream separator to Texas (Gillespie 2012). Invented by Carl Gustaf Patrik DeLaval of Sweden in 1878, patented in the United States in 1881, and manufactured in Poughkeepsie, New York, the DeLaval cream separator revolutionized fluid milk treatment on family farms and dairies. It used centrifugal force to separate cream from milk in a continuous hand-driven operation and increased the potential for larger volume production (http://dairyantiques.com/Cream_Separators_2.html). The separator marked "the beginning of the rapid development of the dairy industry . . . put[ting] dairying on a paying basis. It . . . furnished a means for better homes, for better barns and for better equipment." According to one student of the dairy industry, the "cream separator is universally recognized as having been one of the greatest factors in modernizing dairying" (<http://www.old-engine.com/delaval.htm>).⁴

Vance's introduction of the cream separator to Texas probably helped spur fluid milk production, the preponderance of which was located from the Red River area southward through East Central and Central Texas by 1889. It also changed dairying from a subsistence-level activity to an industry. Within ten years, there had been remarkable growth in milk production, with 32 counties (versus two counties in 1889) reporting production of over 2.5 million gallons per county. That growth was mirrored in the 13 counties that comprise the study area and pointed to the productivity of the region. In 1889, Bell County was one of the two Texas counties producing in excess of 2.5 million gallons of milk, and McLennan, Coryell, Falls, Williamson, Travis, and Comal Counties were all in the next tier of production (1.0–1.5 million gallons each). By 1899, McLennan, Coryell, Bell, Milam, Williamson, Travis, and Bexar Counties

³ USDA agricultural censuses reported the number of cows on farms on January 1 of even-numbered years, e.g., 1900. Dairy products, such as gallons of milk produced, were totals from the previous year, e.g., 1899.

⁴ According to *Farm and Ranch* (December 10, 1910:8), "The invention of the cream separator and the Babcock test ha[s] marked the beginning of scientific dairying." The separator "enabled thousands who are living in isolated communities to place their dairy products upon the market and get the benefit of increased prices for these products."

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were 7 of the 13 Texas counties producing more than 2.5 million gallons, while Falls, Bastrop, and Guadalupe Counties were in the next tier of production (1.5–2.5 million gallons per county) (Texas Planning Board n.d.e). Nonetheless, Texas in 1900 still continued to lag far behind Midwestern dairy states, having only 12 creameries and, with a population one-third greater than that of Iowa, producing one-third as much butter (A. H. Belo & Co. 1904:136).



Figure 4-8. Czewski Family Wagon Yards and Dairy, Childress County, n.d. The Czewski family wagon yard and dairy are depicted in this image, which also shows the horse-drawn buggy used to make milk deliveries. While the property is not located in the study area, the dairy cattle shown in the picture were typical of the unimproved dairy stock commonly found in Texas in the late nineteenth century. Source: The Portal to Texas History.

With changes in production and emergence of farms focused primarily or exclusively on the care of dairy cows and production of milk, it is likely that improvements such as dairy barns and silos would have begun to appear in the agricultural work and pasture zones (*Figure 4-8*). Even though cement products were widely available in the study area, it is likely that barn floors continued to be earth and that buildings associated with the housing of dairy cattle were frame or stone.

DEVELOPMENT PERIOD: 1900 TO 1920

After record production in 1899, fluid milk totals in Texas and the 13-county study area lagged for the next two decades, while the number of milk cows first increased from 800,000 in 1900 to 950,000 in 1910, and then decreased slightly to 930,000 in 1920; the largest decrease by far occurred in 1917–1918, when a devastating drought that dried up water sources and destroyed crops resulted in a decrease in dairy cattle populations from 1.0 million to 960,000 cows (Buechel 1942: Table 79; Texas Planning Board n.d.e).

Nonetheless, individuals, state and federal agencies, and trade publications and associations continued to tout the financial and other benefits of dairying. In the area of education, for example, Christopher Otto Moser acted as an “apostle of scientific dairying” and “managed an experimental government dairy farm at Denison” early in the twentieth century while also organizing a dairy company, creamery company, and silo company (Perez 1996: 854). Influential and widely read agricultural publications such as *Farm and Ranch* published heavily illustrated articles about the benefits of dairying. In 1905, the journal published an article entitled “Dairying in Texas” that promoted the timeliness of dairying because people were “agitating diversification.” In addition, half of the state was “infected with boll

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weevil, making the cotton crop a failure.” The author lamented that the state imported large amounts of dairy products from the North and described a dairy farm cycle that could be successful almost anywhere in Texas: raise feeds and grains on the farm, then feed them to the dairy cow that digests the food and defecates the portion that acts to improve fertility of the soil. The remaining 10 percent of ingested feed went to make milk, after which the cream was separated and the skim milk fed to the farm’s young animals (*Farm and Ranch*, August 26, 1905: 12–13).

Four years later, the same journal focused again on the benefits of dairying, describing the impact that town-based creameries had on dairy operations in the outlying rural landscape, the side benefits to hog raisers, and the financial benefits to dairymen (*Farm and Ranch*, December 4, 1909: 1, 3–4). Other articles in the issue informed readers that dairying was a cash business that could provide a steady income and pointed to the benefits of good breeding through improved bulls. At dairies where butter was made, the resulting skim milk could be fed to hogs, another valuable farm animal. Dairying also provided a ready market for feed crops grown on the farm, and the fertility of the manure was a benefit to soils depleted by monoculture. Other articles discussed the benefits and designs of silos and drew a connection between access to interurban roads and rapid delivery of dairy products (*Farm and Ranch*, December 4, 1909: 2, 4, 9).

Early dairy associations such as the Texas Dairymen’s Association, formed in 1907, and the Texas Creameries Association also worked to promote dairying in Texas, where less than 25 percent of the population’s demands for milk products were being met by in-state producers. The Texas Dairymen’s Association, in particular, worked to educate its membership about the importance of reading dairy and other agricultural publications to learn the associated science. Attendees of the 1908 Texas Dairymen’s Convention, for example, heard about cows and the treatment of milk from milking to storage and about proper disposal of wastewater and manure. Speakers described the difference cream separators and improved distribution of milk had made to farmers who were located at some distance from urban centers. They also noted the impact of the boll weevil on cotton production, the need for more diversified agricultural practices, and the impact of dairy farming on hog and chicken raising, improvement of depleted soils, and general improvement of farmsteads ([Texas Dairymen’s Association] Secretary 1908: 4–10, 13–16, 50, 92). The extent to which farmers were convinced of the profitability of dairying may be reflected in statistics about butter made in Texas factories. In 1899, factories produced only 252,714 pounds of butter; in 1909, factories, which numbered 46, produced 2,133,590 pounds of butter (*The Galveston-Dallas News* 1910:104).

Attendees received specific information about the design, placement, and construction of a Texas dairy barn, and speakers noted the recent beneficial appearance of solid concrete floors ([Texas Dairymen’s Association] Secretary 1908: 25, 28–34). While it is unlikely that such improvements as concrete floors were widespread on dairy farms prior to the 1920s, when they became a requirement in many areas, the growing emphasis on cleanliness, the availability of trade literature, and increasing opportunities for training through dairy institutes in Texas towns meant that dairymen increasingly were exposed to standard plans and specifications for dairy barns, milk houses, silos, sewerage disposal systems, and

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other buildings and infrastructure associated with the operation of dairy farms. It is likely that most construction would have continued to be frame, but wider use of readily cleanable materials such as concrete or fired clay would have been increasingly common, together with features such as concrete water troughs.

The year 1919 represented a low point in the number of gallons of milk produced (202,953,536; an amount considerably less than the 251,342,698 gallons produced in 1899). On January 1, 1920, the number of dairy cows also had decreased to 930,000 (Buechel 1942: Table 79). The figures available for the 13-county study area demonstrated a similar decrease, but large-scale milk production was more widespread than in 1909, when Bexar, Bell, and McLennan Counties were among the highest producing counties in the state. Instead, in 1919, McLennan, Falls, Bell, Milam, Williamson, Travis, and Bexar were 7 of the 31 counties reporting in excess of 1.5 million gallons of milk produced (Texas Development Board). Interestingly, the pounds of butter made in factories had continued to grow dramatically (at 10,911,466 more than five times the amount in 1909), which was perhaps evidence that Texas dairymen were increasingly committed to factory-produced rather than farm-produced butter.

DEVELOPMENT PERIOD: 1921 TO 1945

The nadir of 1920 was followed by decades of growth in the Texas dairy industry. Fueled by improvement of roads, urban growth, the continued impact of the boll weevil on cotton production, federal programs that rewarded investment in livestock and discouraged cotton cultivation, a popular



Figure 4-9. Heep Dairy Farm, 1950. Entrance to the Heep Dairy Farm depicting the formal gates, residence to the right, and dairy barn with silos in the center of the image. The dairy was located south of Austin near what is now the IH 35/SH 45 intersection and was owned by Herman Heep, who acquired the property and a prize-winning herd of dairy cattle after making his fortune in the oil fields in the 1920s. [Citation: Ron Ralph, A Heep of History, paper delivered to the Manchaca Onion Creek Historical Association, Marcy 6, 2010.] Source: The Portal to Texas History.

mania for construction of cheese factories (Figure 4-9), increasing application of scientific methods, and strengthening of the cooperative movement, the dairy industry grew. At the same time, passage of laws and regulations and greater appreciation for the hygiene of milk handling helped formalize and bring consistency to the design of farm buildings and other facilities associated with the housing, care, and feeding of dairy cows and with the handling of milk products.

The boll weevil that had entered Texas in the 1890s had reached all areas of cotton production by the 1920s. Problems controlling the pest, together with

weakness in the cotton market and persistent government and academic fears about the long-term effects of tenancy opened the door for promotion of alternatives to cotton culture, including dairying and the raising of grains for feed. By 1924, farmers in all but one Texas county were recording milk

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production that totaled 274,540,639 gallons, an increase of 35 percent over production in 1919. Of the 33 counties reporting in excess of 2,225,000 gallons, six of them (McLennan, Bell, Milam, Williamson, Travis, and Bexar) were in the study area; another 2 counties (Falls and Guadalupe) produced more than 2.0 million gallons, and the remaining counties were not far behind. Bexar County, with its booming population, had almost doubled its production from 3,562,763 gallons in 1919 to 6,776,976 gallons in 1924, despite the effects of a severe drought during which there was no rain from the early fall of 1924 until September 1925. The trend continued between 1924 and 1929, when statewide production increased 50 percent. A report from the Texas Planning Board noted that “as in former years, the most remarkable growth was in the leading agricultural belt, in Central and North Central Texas.” The Board’s records confirm the pattern, with McLennan, Bell, Williamson, Travis, and Bexar Counties being among the top milk producers in the state, and Coryell, Falls, Milam, and Guadalupe Counties being in the next tier of production.⁵ The remaining, smaller counties of Hays and Comal produced 1,465,354 gallons and 1,190,749 gallons respectively (Freeman 1994: 104; Texas Planning Board n.d.e).

While milk production soared by 103 percent during the 1920s, the numbers of milk cows did not increase proportionately (29 percent). Reasons for increased milk production alone included the continued growth of population, particularly in urban areas, improvement of transportation networks that was encouraged by federal aid for construction of farm-to-market roads beginning in 1921 and continuing through the 1930s, the proliferation of truckers who began to capture trade in dairy products and other perishables, and the availability of “thermos” motor trucks that transported milk over highways (A. H. Belo Corporation 1929: 126; <http://www.usda.gov/history2/back.htm>). Cotton production, which had already slowed, was further depressed by the drought of the early 1930s and by government policies that forced cotton acreage reduction, encouraged cultivation of feed crops, and touted the benefits of dairying to soil improvement and rebuilding (Texas Planning Board n.d.h).

Increased milk production also was encouraged by public interest in financing local creameries and cheese factories. In January 1928, investors in the Lone Star Cheese and Butter Company opened a plant in Round Rock that used milk from 20 area farms; by April, there were 140 dairy farm suppliers who were located along a 25-mile route, and by 1929, 225 farms supplied milk to the factory from a distance of up to 30 miles. Farmers, many of whom were Swedish, purchased additional dairy cows, and the number more than doubled in 1928. Other plants opened in Buda and Waco, where dairying was credited with fostering industrial development, increasing local prosperity, supplanting local dependence on cotton, increasing student enrollment in schools, and spurring grain production. In Waco, businessmen and others enticed the Borden Milk Company to establish a \$500,000 plant in the city that resulted in better agricultural conditions in McLennan and surrounding counties. The *Texas Commercial News* went so far as to credit the burgeoning dairy industry with civic improvements, the

⁵ In 2006, Knight and Associates, Inc., in association with Preservation Central, examined the history of the Heep Dairy Farm as part of TxDOT study in support of the proposed construction of SH 45 Toll in Hays County. It provides detailed case study that examines dairying operations in the Central Texas region. The report is entitled Heep Jersey Farm Rural Historic District Intensive-Level Survey and NRHP Documentation for Mitigation for SH 45 SW and is on file with TxDOT Environmental Affairs Division.

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passage of \$16 million of good road bonds, establishment of new industries, and expansion of older ones (Dolph Briscoe Center for American History, Vertical Files: Dairying; *Hays Free Press*, March 5, 2009; *Texas Commercial News*, April 1929).

Milk production increased greatly during the 1920s, but the number of dairy cows in the state grew only modestly. This lack of proportional growth continued during the 1930s,⁶ continued through World War II, and accelerated after the war when the numbers of cattle dropped off precipitously while production continued to increase. Several factors may have played a role in this pattern. First, the legislature enacted the Cooperative Marketing Act, and the cooperative movement spread widely among dairymen, who were probably encouraged by passage of the Capper-Volstead Act of 1922 that gave co-ops legal standing (Canada [1948]: [3]; <http://www.usda.gov/history2/back.htm>). By the early 1930s, co-ops were assisting milk producers in their conflicts with distributors and coordinating with credit entities that assisted in funding what usually was an expensive enterprise (Canada [1948]: [2]; *Texas Cooperative Dairyman*, December 1932). Second, as production increased, municipalities and the state legislature began to pass laws to ensure that milk and milk products were safe for public consumption. An early ordinance regulating milk and milk products sales was passed by the City of Austin in 1927. It defined grades of milk, described acceptable practices for handling milk, and provided specifications for buildings associated with dairying, including dairy barns and milk houses or rooms ([City of Austin] 1927: 12-23). As the state gradually was divided into “milksheds,”⁷ the affiliated urban centers passed ordinances that were similar in a number of ways and usually were based on state and federal legislation. In 1931, the state legislature passed an act establishing the Babcock test as the official dairy test for Texas and required that it be used to confirm the percentage of butterfat in milk or cream, assuring that producers and distributors did not water down the product (Texas 42nd Legislature, Regular Session 1931:735–737). Other laws prohibited “filled milk” (1935), required medical inspections of dairy employees (1937), promulgated milk grading and labeling laws (1937, 1942), and prohibited the sale of milk cows infected with Bang’s disease (1939). With more-stringent restrictions, public confidence in the purity and safety of milk products grew; an essential component of increasing consumption of fluid milk.

The Texas Almanac identified a number of factors in the 1920s that contributed to the growth of the dairy industry. These included growth of great population centers, educational efforts by the Agricultural and Mechanical College and dairy organizations, faster railroad service, construction of good roads, the establishment of milk routes and concentration stations developed by big creamery concerns, and improved breeding (A. H. Belo Corporation 1927: 120; 1929: 126). However, the greatest contributor to increased milk production beginning in the 1920s may have been the formalization of

⁶ According to Buechel and Johnson (1938:36), farm cash income from dairy products in Texas increased nearly 50 percent from 1927 to 1937. Data used did not include the value of butter sold directly from the producing farms, which was “a considerable quantity” in certain areas of the state.

⁷ Milksheds were comprised of major urban areas and the counties that contributed to milk production in those areas. The term was used by at least 1938; in 1959, Houston’s milkshed consisted of 40 counties and included Caldwell, Bastrop, Milam, Falls, and McLennan Counties, some of which undoubtedly contributed product to Waco, Austin, and San Antonio, as well (Buechel and Johnson 1938:15; *Houston*, June 1959:20).

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ideas about what constituted an ideal dairy farm that could respond to the requirements of the public. This occurred largely as a result of the distribution of literature and training by dairy cooperatives, dairy associations, and county agents. While Texas dairymen had described elements of ideal operations by the early twentieth century, practices and facilities probably varied widely, depending on the individual dairyman's resources and capacity for engaging in agricultural practices that differed significantly from those associated with the raising of beef cattle or crops such as cotton.⁸ By the 1920s, however, many agriculturists had embraced the discipline associated with dairying, and they found the information offered by dairy specialists, such as those authorized by the state legislature in 1929, to be helpful (Texas 41st Legislature 1929:56).

Most of the ordinances and laws passed by city and state governments, as well as advice provided by agents, were a combination of general guidelines and specific requirements. Guidelines, for example, pointed to the benefits of raising home-grown feeds, culling herds to rid them of less-productive animals, using purebred or otherwise tested bulls to improve milk product, and avoiding mixing dairy cattle with beef breeds having low milk-producing capacity (Buechel 1942: 8; *Farm and Ranch*, July 1, 1933: 2). The same publications pointed out the necessity for successful dairies to have abundant supplies of clean, fresh water conveniently located to the operation (*Farm and Ranch*, June 15, 1933). Practical scholars such as Scoates at Texas A&M University (Scoates 1937) and Thomas, Reaves, and Pegram in North Carolina and Virginia (Thomas et al. 1949) sought to inform dairymen about the needs of their herds from the perspective of the cows, which produced best when gently handled and milked regularly. They emphasized the absolute need for hygienic practices at every step.

Beyond general guidelines, dairymen had access to a great deal of literature that provided very specific information about farm layout, buildings, and equipment. Some of the information was embedded in ordinances. The 1927 City of Austin ordinance, for example, specified lighting, air space, and floor, wall, and ceiling construction for dairy barns as well as general construction requirements for milk houses or rooms. It also spelled out requirements for toilets and water supply ([City of Austin] 1927: 12–14). The 1937 law passed by the state legislature and both State Department of Health publications about Texas milk and milk products laws (Texas State Department of Health 1938: 12–21; 1953: 16–23) laid out specific requirements that reiterated the guidance supplied by the City of Austin and added more regarding topics such as partitions and doors between feed rooms and milking spaces. Daniels Scoates went so far as to discuss systems of stalling dairy cows for milking purposes. He enumerated the types of dairy barns and provided design details for roofs, walls, ceilings, doors, windows, floors, and other building elements. He also described milk houses, calf pens, and bull pens, and provided detailed drawings. Because dairying was closely allied with hog raising, Scoates provided equivalent information

⁸ Buechel wrote in 1942 that Texas had most of the natural factors that would lead to expansion of the dairy industry. However, the industry had grown comparatively slowly due to “the lack of experience and skill and the disinclination of the average Texas farmer consistently to perform the exacting duties essential to successful dairying. Much of the lack of interest in the dairy industry, as is well known, stems from the traditional one-crop system (primarily cotton and, to a lesser extent, wheat) which has so long influenced Texas rural psychology.” Statistics indicate that large areas of Central Texas had overcome such drawbacks by the 1920s (Buechel 1942:6).

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for hog houses. He also enumerated, described, and illustrated grain and roughage storage structures, including silos (Scoates 1937).

While construction of barns, silos, milk houses, pens, and watering devices probably fell within increasingly narrow design parameters in the Blackland Prairies region, where many dairy-associated properties were constructed of wood or metal, architectural variety was common in Bexar County and the Hill Country, where proximity to D'Hanis and other clay tile manufacturing communities made tile, as well as concrete, a common building material. In addition, the use of stone as a decorative element in the domestic work zone persisted, and older frame and stone residences, outbuildings, and landscape elements such as walls and entrance gates sometimes were enlarged or otherwise modified with newer stone work executed in styles typical of the 1930s and reflective of the recreational identity of the Hill Country in general.

DEVELOPMENT PERIOD: 1945 TO CURRENT

Texas dairy herds increased modestly during World War II, growing from 1,349,776 animals on 337,424 farms in 1940 to 1,594,000 animals in 1945 (Odom 1996:473–474). Fluid milk production increased so much throughout the United States that the Washington office of the Office of Price Administration attempted to regulate regional milk in order to “establish a balanced relationship [among] all of the component factors affecting prices, demand and supply.” In an industry that was becoming increasingly structured, the federal government attempted to “establish wholesale and retail prices in each area,” the idea being to enable producers to keep supplying fluid milk in the quantities needed by distributors while being compensated at higher prices than were allowed for manufacturing milk (Seelye 1951:52).

Federal regulations created some degree of problems for producers and for small towns relative to large cities during and after World War II, but the fact that Texas' urban population grew by 50 percent or more between 1940 and 1950 (Batschelet 1953) meant that dairy farming remained a robust enterprise. San Antonio's milkshed, for example, consisted of nine counties and had 363 dairy farms with approximately 18,000 cows that produced 90 percent of the 4,500,000 quarts of milk consumed by the city's residents every month. Examples of such farms were the Rio Vista Dairy Farms near La Coste in Medina County and Sunshine Ranch north of San Antonio in Bexar County. At Sunshine Ranch, now part of a suburban development inside Loop 410, University of Wisconsin graduate Jim Maverick ran herds of 75 Holsteins and 130 registered Jerseys on a 240-acre farm whose beginnings dated to 1905. Using a model such as those outlined in up-to-date guides to dairy farming (Thomas et al. 1949, and later, Ferrell 1953; Reaves and Pegram 1956), Maverick kept more than one-half of the land in permanent pastures; all field land was planted in grazing crops that were used to produce silage. He complied closely with sanitary standards for certified milk and worked continually to improve per-cow milk production through selective breeding, careful record keeping, and feeding of mineral supplements. He also sold stock to other local farmers (*Farm and Ranch—Southern Agriculturist*, September 1958: 14; *San Antonio Express Magazine*, December 10, 1950: 6–8).

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Improved breeding practices, such as those used by Maverick and hundreds of other dairymen, assured that even as herd totals declined precipitously in Texas from 1,594,000 in 1945 to 355,000 in 1971 and 335,000 in 1983, and despite the fact that the total number of producers declined as well, the milk supply was able to respond to demand because the pounds produced per cow increased enormously. As a result, Texas usually ranked in the top 10 states in milk production in the 1970s and 1980s (Odom 1996:474). On the other hand, changes in how marketing occurred, new federal regulations, competition among distributors who battled for hegemony on regional and multi-state levels, and international politics brought some degree of turmoil to the industry and individual dairy farmers. Many small dairies went out of business or were acquired by larger, commercial-scale firms, and home delivery of milk ceased. The sale of grains to Russia in 1972 brought significantly higher prices for that essential commodity to dairy farmers, as did the 1974 failure of the Midwest corn crop and smaller milo harvest in Texas. Federal controls continued to be problematic for dairy farmers during the 1980s, when the government levied a tax on producers to try to alleviate a nation-wide milk glut. Resulting lower profits naturally induced dairymen to produce more milk (*Dallas Morning News*, July 4, 1983). Some relief occurred as a result of the 1985 federal farm bill that decreed that the minimum price paid for milk would increase in relationship to the distance of the producer from Minnesota and Wisconsin. Texas dairymen received top dollar for their milk as a result (*Austin American-Statesman*, November 10, 1990).

By the 1980s, the numbers of dairy farms in Texas had decreased significantly: one dairyman east of Georgetown remarked in 1990 that the 60-odd dairies in the area had shrunk to four in Williamson County and two in Travis County; the total for the state that year was approximately 2,100 dairy farms. In addition, the geographic focus of the industry had shifted, and the demographic composition had altered. Construction of freeways in California and associated skyrocketing land prices led many dairymen there to move to Texas with its less-expensive real estate and relatively high fluid milk prices. Many established operations west of Waco, where they kept relatively large herds and ran feedlot-size operations. However, by the early twenty-first century, a number of those dairymen, together with well-established older operators, had moved to the South Plains area of Texas because of restrictions stemming from new environmental guidelines pertaining to water quality and the potential impact of their operations on the Bosque River (*Austin American-Statesman*, November 10, 1990; March 5, 2002).

Currently, Texas is one of the fastest-growing dairy sheds in the United States and is ranked as the sixth largest milk-producing state, with 520 dairies and 430,000 lactating milk cows. The average dairy farm has 380 cows, and the industry “is the fourth largest commodity contributor to Texas’ GDP.” Top dairy-producing counties as of September 2010 were Hopkins in East Texas; Erath and Comanche in West Central Texas; and Castro, Parmer, Deaf Smith, Hartley, Lamb, Bailey, and Hale in western Texas (www.milk4texas.org). The shift from numerous relatively small operations to large industrial-scale operations occurred during the second half of the twentieth century and was accompanied by the appearance of larger barns to accommodate the larger number of dairy cattle per farm. Pasturing of dairy cattle persisted, but a growing emphasis on feedlots was accompanied by construction of sizeable facilities for storing grain and silage.

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Table 4-1. Summary History of American and Texas Agriculture by Topic

		18th Century	1801-1848	1848-1865	1866-1894	1895-WWI	1918-Depression	1930s-WWII	Post-WWII
Economic Cycles	U.S.	1776-1788: Revolutionary War boom, post-war depression; maritime commerce prosperity.	1815-1822: Speculative boom, panic and depression. 1833-1843: Banking recession, speculative boom in land, banking, etc., Panic of 1837 and depression. 1844: Beginnings of recovery and business expansion.	1844-1856: Recovery and business expansion. 1857-1860: Panic of 1857 and recovery. 1861-1867: Civil War prosperity and inflation; post-war recession.	1868-1873: Railroad boom. 1870s-1900s: Regime of Porfirio Diaz creates ready markets for sales of cattle and sheep. 1873: National Panic. 1873-1878: Depression. 1879-1892: Business expansion. 1893-1894: Panic, widespread bankruptcies, and depression.	1895-1906: Return of prosperity. 1900: 41% of workforce employed in agriculture. 1907-1908: Panic of 1907. 1909-1918: Prosperity and war boom. 1915-1949: U.S. agricultural exports level.	1920-1921: Sharp postwar recession. Postwar: Prices of agricultural commodities collapse. Post-1922: Imposition of federal tariffs encourages sheep and wool production in U.S.	1930: Smoot-Hawley tariff levies import duties on numerous commodities. 1930: 21.5% of workforce employed in agriculture. 1930s: Great Depression. 1939-1945: WWII, wartime recovery. 1945: 16% of workforce employed in agriculture.	1946-1970: Postwar boom. 1955-1980: U.S. agricultural exports grow by almost 600%. 1958-1970: Extended business expansion. 1970: 4% of workforce employed in agriculture. 1970-1980: Rapid inflation; economic growth slows.
	Texas	18th century: Farming largely on a subsistence level; stock raising increasingly large-scale, but impacted by domination of hostile Indian tribes.	1837: Panic of 1837 impacts land and commodity prices.	1850s: Business expansion with influx of military personnel after Mexican War of 1846-1848; greater demand for agricultural products to supply forts at Department of Texas headquarters in San Antonio; livestock industry invigorated. 1861-1865: Departure of federal troops, recession due to Civil War, embargos on cotton trade, labor shortages.	1873: National Panic of 1873 and depression after affects cattle industry. 1893: National Panic of 1893 creates a depression in Texas; land prices plummet, and many large-scale ranches are broken up.	1895-1916: Generally prosperous conditions; agricultural expansion. 1917-1918: Recession due to impact of record drought on crops and livestock.	Post-WWI: Lack of demand for wool results in price declines. Post-1922: Imposition of federal tariffs encourages sheep and wool production in Texas; number of sheep increase from about 3,400,000 in 1920 to 7,600,000 in 1933; goats increase, too; cotton markets rebound and cotton cultivation expands. Early 1920s: Cotton markets collapse, leading to severe recession	Early-to-mid-1930s: Depression. 1937: Recovery; re-entry to depression due to regulation mitigated by large-scale federal War Department expenditures throughout the state.	1946-1950s: Postwar boom.

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		18th Century	1801-1848	1848-1865	1866-1894	1895-WWI	1918-Depression	1930s-WWII	Post-WWII
Government Programs & Policies	U.S.	18th century: Local governments often regulated prices of basic foodstuffs. 1790: Patent Office created; first patent issued pertained to a fertilizer ingredient.	1819: First state board of agriculture established by New York State Legislature. 1820, 1825: Agriculture committees established in U.S. House and Senate. 1830: First soil survey conducted in Massachusetts. 1839: Patent Office begins work with agricultural statistics.	1848-1861: War Department establishes and troops occupy numerous forts, depots, and other military establishments in Texas, infusing cash into economy and demand for commodities. 1862: U.S. Department of Agriculture set up without cabinet status.	1870s: Some states begin to inspect dairy products. 1883: Congress passes wool tariff. 1889: U.S. Department of Agriculture raised to cabinet status; Farmers’ Alliance active on federal level; Bureau of Animal Industry identifies tick as carrier of Texas fever. 1890: Congress passes McKinley Act, raising tariffs on imports; wool heavily protected. 1890: Babcock butterfat test devised. 1890, 1891: Meat Inspection Acts. 1894: Congress passes Wilson-Gorman tariff.	1897: Agricultural production increases emphasized. 1900-1917: Federal government assumes greater role in agriculture with passage of farm legislation. 1906: Food and Drug Act; Meat Inspection Act. 1912: Plant Quarantine Act. 1914: Cotton Futures Act. 1914: Smith-Lever Extension Act establishes federal-state extension service. 1916: Federal Farm Loan Act. 1917: Food Control and Production Acts. 1917: U.S. Army requires wool uniforms.	1921-1922: Government imposes tariffs on foreign wool. 1922-1929: Speculative boom.	Early 1930s: First federal assistance to school lunch program. 1933: Agricultural Adjustment Act (AAA) initiates crop and marketing controls. 1934: Federal “cattle shoot” program impacts numbers of animals on the range. 1935: Farm Credit Act; AAA amended; Resettlement Administration. 1935-1937: Soil Conservation Act creates SCS; Range Conservation Program follows. 1938: AAA expands. 1939: Food stamp plan begins. 1939: Wool Products Labeling Act passes. 1941-1945: Pressure by federal government on agriculturists to increase production. 1942-1949: Price controls and food rationing.	1946: National School Lunch Act. 1949, 1954, 1961, 1962, 1964: Agricultural Acts pass, impact price supports and acreage and crop allotments. 1955-1972: Increased emphasis on rural development and renewal. 1956: Soil Bank Program authorized. 1957: Poultry Inspection Act. 1964: Food Stamp Act. 1970s: Surplus agricultural products disposal overseas.
	Texas	Mid-1770s: Spanish government makes large livestock grants in San Antonio River valley and along the Rio Grande in South Texas. 1793: Secularization of missions hampers livestock industry.	1810-1821: Mexican War for independence leaves ranches vulnerable and decimates livestock herds. 1820: Spanish government passes measure to open Texas to foreigners. 1823: Mexican colonization law. 1825: State colonization law grants grazing and crop lands. 1830: Mexican law forbids further introduction of slaves. 1836: Texas constitution guarantees Texans their slave property. 1836-: Republic of Texas continues liberal land grant practices. 1845: Republic of Texas passes first Pre-emption Act.	1848-1861: Texas benefits economically when U.S. War Department establishes military facilities in the state, creating new markets for commodities. 1850: 58,161 slaves in Texas. 1853-1854: Acts extend homestead grants. 1858: Geological and Agricultural Survey of Texas sponsored by the state. 1860: 182,566 slaves in Texas.	1866, 1870, 1873, 1875, 1879: Acts continue policy of homestead grants, result in considerable settlement. 1871: Texas Legislature passes bill creating Bureau of Immigration to encourage immigration. 1876-1907: Bureau of Agriculture, Insurance, Statistics, and History replaced by Texas Department of Agriculture. 1884: Texas Legislature passes law making fence cutting a felony. 1890: McKinley Act levies duties on certain classes of wool and protects U.S. production. 1891: Railroad Commission created. 1894: Wilson-Gorman Act floods American market and creates new lows for domestic wool in Texas.	1907: Legislature creates Texas Department of Agriculture.	1920s: Cities pass laws regulating production and treatment of milk products.	1931: Legislature establishes Babcock test as official dairy test and requires use. 1934: Federal “cattle shoot” program dramatically impacts numbers of animals on the range. 1934-1939: Elm Creek Watershed Project covers <i>ca.</i> 300 square miles of Blackland Prairie, largest in U.S. 1936-1937: SCS and Range Conservation Program result in major alterations to landscapes. 1937: Legislature passes laws regarding milk products. 1941-1945: Wartime demand from federal government forces prices higher and benefits Texas agriculturists.	1945-1947: Improved economic situation for Texas farmers, thanks to federal price guarantees, assists modernization of agriculture. Post-WWII: Federal acreage allotments and marketing quotas encourage crop diversification and helps stabilize agricultural income. Other programs maintain control of typical Texas crops such as wheat, cotton, feed grains, etc. Price supports result in idle acreage that is used for grass and hay production.

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		18th Century	1801-1848	1848-1865	1866-1894	1895-WWI	1918-Depression	1930s-WWII	Post-WWII
Weather Events	U.S.		1815-1816: Eruption of Mount Tambora leads to year without summer across North America and Europe; major food shortages; may have been instigator for migrations from New England to the Midwest.		1885-1886, 1887: Blizzards and drought disastrous to northern and southern Great Plains cattle industry; blizzards kill more than 85% of cattle herds.	1900: Galveston Hurricane deals major damage not only to coastal Texas but also to the Midwest, Great Lakes region, and New Brunswick.	1926-1927: Great Mississippi River Flood changes agricultural and demographic landscape in the Mississippi River Valley and much of the South.	1930s: Drought affects much of the U.S.; becomes one reason for federal political initiatives.	
	Texas	Early 1700s: Worst recorded multi-year drought for the period 1523-2008. 1772-1791: Long drought regime impacts mission farming and ranching activities. 1786: Severe winter destroys large numbers of livestock.	1833: Record flood in Brazoria County. 1837: Racer’s Storm lays waste to the southern coastal area. 1840-1863: Pan-regional drought is second worst for the period 1523-2008 and peaks in the late 1850s. It kills crops, livestock are driven off by Indians suffering from drought’s effects, and there is general population loss.	1855: Record freeze destroys much of crop production throughout the state. 1855-1864: Ranked as worst decade-long drought for the period 1698-1980.	1870s: More intensive use of prairie soils and sub-humid sections (Central Texas generally), where rainfall is more uniform; leads to revolutionary consequences in agricultural production and commerce. 1870s: Western half of Texas generally droughty. Early 1880s: Beneficial weather results in record crop yields and livestock numbers. 1885-1886 : Drought devastates livestock industry in western half of Texas. 1886: Hurricane that damages agriculture between the coast and San Antonio temporarily breaks drought. 1891-mid 1890s: Drought and depression force ranchers to liquidate stock; many large ranches sold and divided.	1895: Record heat wave. 1899: Record flood on Brazos River destroys plantations and damages crops within basin from Waco to the Gulf of Mexico. 1905-1917: Pluvial conditions in parts of Texas lead to agricultural abundance. 1913: Major floods on Brazos and Colorado Rivers. 1917-1918: Drought in western half of Texas, worst since 1850s; lack of crop production impacts state economy, ability to participate in national “feed the world” movement, ability to fund county bonds necessary for road construction.	1919: Record rainfall brings record crop yields. 1925: One of worst single-year droughts on record in much of Texas. 1926: Drought broken by record rainfalls, resulting in flooding.	1930s: Drought conditions, but less severe than in many other parts of the U.S.	1947-1957: Pan- regional drought is third worst for the period 1523-2008. It severely impacts livestock and crops. 1980: Heat wave worst since 1895.

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		18th Century	1801-1848	1848-1865	1866-1894	1895-WWI	1918-Depression	1930s-WWII	Post-WWII
Crops & Livestock	U.S.	<p>18th century: All forms of domestic livestock, except turkeys, are imported. First Merino sheep imported.</p> <p>1795-1815: Sheep industry emphasized in New England.</p>	<p>1805-1815: Cotton begins to replace tobacco as chief Southern cash crop.</p> <p>1810-1815: Demand for Merino sheep sweeps the U.S.</p> <p>1815-1830: Cotton most important cash crop in the South.</p> <p>1819: Secretary of Treasury instructs consuls to collect seeds, plants, agricultural inventions.</p> <p>1820s: Specialized swine are imported or developed.</p> <p>1836-1862: Patent Office collects agricultural information and distributes seeds.</p> <p>1840-1860: Hereford, Ayrshire, Calloway, Jersey, and Holstein cattle are imported and bred.</p>	<p>1849: First importation of Angora goats.</p> <p>1860s: Cotton belt begins to move west; corn belt begins stabilizing in Midwest.</p>	<p>1866-1869: Era of the Great Plains cattlemen.</p> <p>1870s: Increased specialization in farm production; foot-and-mouth disease first reported in U.S.</p> <p>1880s: Improved cattle breeds increasingly appear in western and southwestern Great Plains region.</p> <p>1886-1887: Blizzards and drought disastrous to southern Great Plains cattle industry, impacts state economies.</p> <p>1889: Bureau of Animal industry identifies carrier of tick fever.</p> <p>1890: Babcock butterfat test devised.</p>	<p>1900: An average of five commodities grown on each U.S. farm.</p> <p>1900-1910: Turkey red wheat introduced from Europe in the late nineteenth century emerges as commercial crop.</p> <p>1900-1920: Extensive experimental work to improve plant and animal breeding.</p> <p>1900-current: Number of farms falls 63%; average size of farm rises 67%; gradual focus on fewer commodities per farm as productivity achieves industrial levels.</p> <p>1910-1920: Grain production reaches into most arid sections of Great Plains.</p>	<p>1926: First hybrid seed company organized.</p>	<p>1930-1935: Use of hybrid seed becomes common in Corn Belt.</p> <p>1938: Cooperative organized for artificial insemination of dairy cattle.</p> <p>1940s: Acreages of crops required for horse and mule feed decrease sharply as farms use more tractors.</p>	<p>1945-1990: Farm population and number of farms decline, average value of assets and cash receipts greatly increases, sizes of farms double.</p> <p>Post-WWII: Large commercial farms and ranches become dominant.</p> <p>1950s: Farms use more tractors.</p> <p>1945-1955: Increased use of herbicides and pesticides.</p> <p>1947: U.S. and Mexico prevent spread of foot-and-mouth disease.</p> <p>1955: Sterile flies used for screwworm control.</p> <p>1970: High-yielding wheat varieties developed.</p> <p>Post-1970: Livestock and livestock products cash receipts exceed crop sales.</p> <p>1978: Hog cholera officially eradicated.</p> <p>1980s: Biotechnology becomes viable for improving crop and livestock products.</p>

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		18th Century	1801-1848	1848-1865	1866-1894	1895-WWI	1918-Depression	1930s-WWII	Post-WWII
	Texas	<p>18th century: Extensive herds of cattle, sheep, and goats are in San Antonio River Valleys; animal breeding unimproved.</p> <p>18th century: Cotton grown by Spanish missionaries in San Antonio.</p> <p>Last third 18th century: Spanish Texas has 40,000-50,000 sheep.</p>	<p>1821: Anglo-American settlers grow cotton.</p> <p>1830s: Cattle drives from East Texas to Louisiana.</p> <p>1839-1840: 6,970 bales of cotton harvested.</p> <p>1840s-1850s: Cattle drives up Shawnee Trail to Midwestern states.</p> <p>1844-1845: 25,879 bales of cotton harvested.</p> <p>1846: Edward Piper drives 1,000 head of cattle from Texas to Ohio.</p>	<p>Post-1846: Volume of agricultural production increases due to Federal military posts.</p> <p>1849-1850: 58,072 bales of cotton reported.</p> <p>1850s: Center of cattle production is eastern half of state.</p> <p>Early 1850s: Southdown and Leicester sheep imported.</p> <p>1850s: Widespread interest in sheep raising and wool production; major sheep drives to Texas from the Midwest and Ohio Valley.</p> <p>1850s: Angora goats imported.</p> <p>1852: Texas one of top producing cotton states.</p> <p>1852-1854: Sheep ranches established in the Hill Country by G. W. Kendall, an important early breeder. Mid-1850s: Outbreaks of cattle fever lead to quarantines declared by Missouri and Kansas; some cattlemen drive herds to California instead.</p> <p>Late 1850s: Texas cattle drives north originate in Central Texas despite quarantines.</p> <p>Late 1850s: Probable first introduction of Angora goats to Central Texas.</p> <p>1859: 431,645 bales of cotton produced.</p> <p>1860: Texas by far the leading state in cattle production; most cattle on Blackland, Interior Coastal, and Coastal Prairies; and on the Plains, eastern Edwards Plateau, and South Texas.</p> <p>Civil War: Cattle production suffers from lack of federal military demand; cotton production declines.</p>	<p>1866: Resurgence of cattle drives.</p> <p>1870-: Farmers begin using prairies and sub-humid sections of temperate zones more intensively.</p> <p>1870s-mid-1880s: Height of trail driving era. Ranchers move west in greater numbers, freeing up area to east for crop production.</p> <p>1870-1885: Numbers of sheep increase, reaching a peak in 1884-1885.</p> <p>1879: 2,178,435 acres produce 805,284 bales of cotton.</p> <p>1880s: Creameries established, soon fail. DeLaval cream separators introduced to Texas.</p> <p>1880s: New emphasis on improved cattle breeding.</p> <p>Mid-1880s: Texas the chief cotton state; production centered in Blackland Prairie.</p> <p>1880s: Spread of railroads results in adjustments to ranching industry brings end to livestock drives.</p> <p>Late 1880s, early 1890s: Cattle numbers hit new high, then cattle and sheep begin decline in response to drought and economic depression.</p> <p>1889: 3,934,525 acres produce 1.5 million bales of cotton.</p> <p>1890: Sheep move northwestward from South Texas plains to Edwards Plateau.</p> <p>1890: Cotton limited mainly to Blackland Prairie.</p> <p>1890: Milk production concentrated in Central Texas; 118,475,000 gallons produced in state.</p> <p>1892: Boll weevil crosses Rio Grande into Texas and begins to spread north and east.</p>	<p>1895: Ranges stocked with a low of about 8.5 million grazing livestock units.</p> <p>1895-1903: Numbers of cattle resurge.</p> <p>1900: Number of sheep is 1,440,000; Texas leads nation in mohair production (29% of total).</p> <p>1900: 7,178,915 acres produce <i>ca.</i> 3.5 million bales of cotton; Texas largest producer in U.S.</p> <p>1900-1918: Numbers of sheep remain low; numbers of cattle reach another low in about 1913, then begin to rise.</p> <p>1900-1920: Cultivated acres increase from 15 to 25 million; value of livestock more than doubles.</p> <p>Early 1900s: Center of cotton cultivation begins to shift to the High Plains and Rio Grande Valley.</p> <p>Early 1900s: C. O. Moser acts as apostle of scientific dairying.</p> <p>1909: 2,517,973 bushels of wheat harvested.</p> <p>1910: Number of sheep is 1,808,709.</p> <p>1910: 3,049,409 bales of cotton produced (30% of U.S. total).</p> <p>1910s: Series of freezes in southeastern and South Texas endanger new fruit and vegetable industry.</p> <p>WWI: Worldwide demand for wool for military uniforms spurs growth in industry.</p> <p>1917-1918: Crop and animal production dramatically impacted by record drought; Texas cannot participate in federal “feed the world” program.</p>	<p>1918-1934: Numbers of sheep rise precipitously.</p> <p>1919: Record crops follow record rainfall; Texas largest cotton producer (13,429,000 bales); 36,219,106 bushels of wheat harvested.</p> <p>1920: Low point in number of dairy cows (930,000) and gallons of milk produced (202,953,536).</p> <p>1920-1950: Wheat industry grows rapidly due to new types, better machinery, rising prices, decreased cost of production.</p> <p>1920s: Number of farms and wheat and cotton acreages increase.</p> <p>1920s: Cities pass laws to insure safety of milk and milk products.</p> <p>1924: 20,545,715 bushels of wheat harvested.</p> <p>1924: 4,856,42 bales of cotton produced.</p> <p>1925: Milk production increases to 274,540,639 gallons.</p> <p>Late 1920s: Widespread interest in cheese factories; formation of cooperatives encouraged by Cooperative Marketing Act (Texas).</p> <p>1929: Meat packing (wholesale) industry ranks second to petroleum refining.</p> <p>1929: 43,979,208 bushels of wheat harvested.</p> <p>1929: 3,793,392 bales of cotton produced.</p> <p>1930: Statewide production of milk increases 50% between 1925 and 1930.</p> <p>1930: Sheep and lamb production centered on Edwards Plateau and eastern Trans-Pecos; number in Texas is 7,021,334.</p>	<p>1930s: Sheep and goats continue concentrated in Edwards and Stockton Plateaus.</p> <p>Early 1930s: In 1934, ranges stocked with 11,333,333 grazing units, largest number since 1902.</p> <p>1931: Texas mohair production represents more than 85% of total for U.S.</p> <p>1934: Federal “cattle shoot” results in decrease in livestock numbers.</p> <p>1934: 26,282,050 bushels of wheat harvested.</p> <p>1934: 2,306,424 bales of cotton produced.</p> <p>1936-1940s: Numbers of sheep rise precipitously again.</p> <p>1939: 28,096,367 bushels of wheat harvested.</p> <p>1940: Texas produces 89% of all mohair in U.S.</p> <p>1940: 1,349,76 dairy cows on 337,424 farms.</p> <p>1941: 10,333,333 sheep on Texas farms and ranches, most of them in the Edwards Plateau area.</p> <p>1942: Texas has more sheep than any other state.</p> <p>1944: 81,415,285 bushels of wheat harvested.</p> <p>1944: 2,536,401 bales of cotton produced.</p> <p>1945: 1,594,000 dairy cows in Texas.</p>	<p>1949: 75,277,232 bushels of wheat harvested.</p> <p>1949: 5,549,667 bales of cotton produced.</p> <p>1950s-1980s: Federal price controls on milk are problematic for producers; many go bankrupt in 1970s.</p> <p>1954: 3,548,337 bales of cotton produced.</p> <p>1957: Texas ranks sixth in U.S. for wheat flour production.</p> <p>1959: 50,116,390 bushels of wheat harvested.</p> <p>1959: 4,155,986 bales of cotton produced.</p> <p>1961: 86,956,000 bushels of wheat harvested.</p> <p>1964: 3,915,081 bales of cotton produced.</p> <p>1969: 3,040,790 bales of cotton produced.</p> <p>1974: 2,505,597 bales of cotton produced.</p> <p>1978: 3,753,276 bales of cotton produced.</p> <p>1970s-1980s: Texas ranks in top 10 states in milk production.</p> <p>1971: 355,000 dairy cows in Texas.</p> <p>1972: 209 grain milling establishments operating in Texas.</p> <p>1978: 54,000,000 bushels of wheat harvested.</p> <p>1980s: Blackland Prairie region characterized by diversified dry land stock farms combining cattle raising with wheat, sorghum, and cotton cultivation.</p> <p>1983: 335,000 dairy cows in Texas.</p>

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		18th Century	1801-1848	1848-1865	1866-1894	1895-WWI	1918-Depression	1930s-WWII	Post-WWII
Agricultural Machinery, Technology	U.S.	<p>18th century: Oxen and horses for power, wooden plows, sowing by hand, cultivating by hoe, hay and grain cutting with sickle, and threshing with flail.</p> <p>1790s: Cradle and scythe introduced.</p> <p>1793: Invention of cotton gin.</p> <p>1794: Jefferson’s plow with moldboard of least resistance tested.</p> <p>1797: First cast-iron plow patented.</p>	<p>1819-1825: U.S. food canning industry established.</p> <p>1834: McCormick reaper patented; plows faced with steel saw blades manufactured.</p> <p>1837: John Deere and L. A. Andrus begin manufacturing steel plows; practical threshing machine patented.</p> <p>1841: Practical grain drill patented.</p> <p>1842: First grain elevator, Buffalo, New York.</p> <p>1843: Commercial fertilizer industry founded.</p>	<p>1849: Mixed chemical fertilizers sold commercially.</p> <p>1850-1870: Expanded markets for agricultural products spur adoption of improved technology resulting in more farm production.</p> <p>1850s: Gail Borden receives patents for condensing process (milk, fruit juices, beef, coffee).</p> <p>1854: Self-governing windmill perfected.</p> <p>1856: Two-horse straddle-row cultivator patented.</p> <p>1858: Mason jars invented.</p> <p>1865-1875: Gang plows and sulky plows come into use.</p>	<p>1868: First use of steam tractors.</p> <p>1869: Spring-tooth harrow for seedbed preparation appears.</p> <p>1870s: Silos and deep-well drilling come into use.</p> <p>1874: Glidden barbed wire patented, initiates fencing of open ranges.</p> <p>1880s: Advances made in commercial refrigeration and provision of cold storage facilities.</p> <p>1881: Hybridized corn produced.</p> <p>Mid-1880s: Power clipping machines for shearing sheep available.</p> <p>1890-1895: Cream separators come into wide use.</p> <p>1892: First gasoline tractor built.</p>	<p>1900: 21.6 million work animals on farms.</p> <p>1900-1910: G. W. Carver finds new uses for peanuts, sweet potatoes, and soybeans, helping diversify Southern agriculture.</p> <p>1910-1915: Large open-gearred gas tractors are introduced in areas of extensive farming.</p> <p>20th century: Proliferation of manufacturing enterprises (gins, slaughtering and packing concerns) spurs crop and livestock production.</p>	<p>1920-1940: Expanding use of mechanized power spurs growth of farm production.</p>	<p>1930: 18.7 million horses and mules on farms; 920,000 tractors.</p> <p>1930s: All-purpose, rubber-tired tractor with complementary machinery popularized.</p> <p>1942: Spindle cotton-picker produced commercially.</p>	<p>1945: 11.6 million horses and mules used for work power on farms; 2.4 million tractors. begins sharp rise.</p> <p>1954: Number of tractors on farms exceeds number of horses and mules for first time.</p> <p>1960: 3 million horses and mules used for work power on farms; 3 million tractors.</p> <p>1968: 96% of cotton Harvested mechanically.</p> <p>1970: Replacement of animal power by tractors essentially complete.</p>
	Texas	<p>18h century: Complex gravity-flow irrigation systems (acequias and aqueducts), based on North African, Spanish, and Mexican models constructed to serve missions, mission ranches, and associated towns and presidios.</p> <p>18th century: Missions sites of mills.</p>	<p>1840s: German immigrants build a mill in New Braunfels to produce cloth from wool.</p>	<p>1850s: Wool manufacturing techniques (carding, spinning, weaving, fulling) improved.</p> <p>Pre-Civil War: Flour and grist milling the first-ranking Texas industry.</p> <p>1859: C. H. Guenther builds first flour mill in San Antonio.</p>	<p>1870s-: Agriculturists begin intensive development of prairies and sub-humid areas using horse- and mule-drawn machinery.</p> <p>1870s: Deep well drilling rigs operate in the Hill Country.</p> <p>1875, 1878: Glidden and Ellwood’s barbed wire available in Texas.</p> <p>1880: Flouring and gristmill products rank first in manufactured value.</p> <p>Early 1880s: Early use of barbed wire on open ranges makes improved breeding feasible. Livestock raisers install more drilled wells, earthen stock tanks, and metal pipe systems.</p> <p>1880s: DeLaval cream separator introduced to Texas.</p> <p>1883-1885: R. S. Munger devises faster, automated system of ginning.</p> <p>1890: Grain milling second in importance of all manufacturing processes.</p> <p>1891: Kleberg builds first cattle dip in the world to combat tick fever.</p> <p>1890s: Cream separators widely advertised.</p>	<p>1900-: New forms of agricultural mechanization and availability of petroleum products modifies structure of agriculture materially.</p> <p>1900: Grain milling third in importance of all manufactured products.</p> <p>Early 1900s: Shift from handshears (blades) to hand-cranked machines for shearing sheep.</p> <p>ca. 1910: Diesel engines replace steam power for gin plants.</p> <p>1910-1940: Grain milling fourth in importance of all manufactured products.</p>	<p>By 1920s: Combines generally accepted; spurred expansion of wheat production.</p> <p>Late 1920s-: Development of major oil fields creates economic engine that helps support ranching enterprises through the Depression and beyond.</p>	<p>1939: About 900,000 acres irrigated, mainly using surface water.</p> <p>1940: 67 grain mills in operation.</p> <p>1940s: Mechanical cotton harvesters marketed widely, greatly reduce manpower needs.</p>	<p>Post-war: Farmers using breaking plows, listers, tandem disks, rotary hoes, grain drills; as many as 200 acres tillable per day; combines greatly improved.</p> <p>Post-war: Increasing use of underground water for irrigation.</p> <p>Post-war: Grain sorghums increasingly important as feed grains.</p> <p>1950s: End of mule/horse era.</p> <p>Late 1960s: Cotton production almost fully mechanized.</p> <p>1971: L. Wilkes devises concept of harvesting cotton by module.</p>

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		18th Century	1801-1848	1848-1865	1866-1894	1895-WWI	1918-Depression	1930s-WWII	Post-WWII
Transportation	U.S.	18th century: Transportation by water and on trails. 1794: First successful turnpike opens.	1825-1840: Canal building era. 1830: Beginning of railroad era. 1840: 3,000 miles of railroad track constructed. 1845-1857: Plank road movement.	1850s: Major rail trunk lines from eastern cities across Appalachians; steam and clipper ships improve overseas transportation. 1860: 30,000 miles of railroad.	1869: First laws regulate railroads; Union Pacific, first transcontinental railroad, completed. 1870s: Refrigerator cars introduced, increasing national markets for fruits and vegetables. 1880: 160,500 miles of railroad.	1899: 75% of national railroad mileage built before 1899. 1910-1925: Road-building accompanies increased use of automobile. 1916: Railroad network peaks at 254,000 miles; rural Post Roads Act begins regular federal subsidies to road building.	1920s: Truckers begin to capture trade in dairy products and perishables. 1921: Federal government supplements aid for road construction through Federal Aid Road Act. 1925: Interstate Commerce Commission must consider agricultural conditions in setting railroad rates.	1930s: Farm-to-market (FM) roads emphasized in federal road building. 1938: Trucking brought under ICC regulation.	1950s: Trucks and barges compete successfully for agricultural products as railroad rates rise. 1956: Congress establishes National System of Interstate and Defense Highways. 1980: Railroad and trucking industries deregulated by Staggers Act.
	Texas	18th century: Transportation by water (river and coastal) and on trails. Trails from Mexico across Texas to Louisiana and New Mexico well developed.	1830s-: Road building a county-level activity. 1836-1845: Internal improvements proposed, including river improvements, canals, plank roads, and railroad; railroads chartered but not built.	1850-1876: Railroads funded by county bonds, state offers of land. 1851-1883: Galveston, Harrisburg and San Antonio Railroad (Southern Pacific) completes line from Harrisburg (Houston) to San Antonio and El Paso. 1861: 9 railroad companies and 470 miles of track.	1870: Texas has 583 miles of railroad track. 1873: Texas railroad system connects to a nationwide network. 1879: 2,440 miles of railroad track in Texas; all but 100 miles located east of Balcones Escarpment. 1880s: More than 6,000 miles of additional track built; beginning of large railroad systems. 1883: Constitutional amendment provides for a county road tax. 1883-1885: Southern transcontinental railroad (Southern Pacific) brings immigrants familiar with milling and equipment associated with mechanized agriculture. By 1890: Southern Pacific extends from Houston to El Paso; era of livestock drives ends with availability of rail transportation. 1891: New Railroad Commission begins to regulate operation of railroads.	1900: Less than 10,000 miles of railroad in Texas; 5% of total U.S. mileage. 1900-1932: 45% of Texas railroad mileage built. 1911: Texas the state with the most railroad mileage. 1916: Texas has 194,720 registered automobiles. 1917: Texas Legislature creates a state highway department and commission, qualifying the state to receive federal funds for road building.	1920s: Expansion of highway system more directly connects agricultural units and markets. 1923: State imposes gasoline tax. 1924: State assumes highway maintenance responsibilities. 1929: Texas has 18,728 miles of main highways; 9,271 miles are hard-surfaced.	1930s: Numerous state and federal highways are improved. 1932: Texas railroad mileage peaks at 17,078 miles. 1936: 1,525,57 registered vehicles in Texas; state highway system includes more than 21,000 miles.	1949: Colson-Briscoe Act appropriates \$15 million a year for local roads. 1962: Legislature increases appropriations for new farm roads to \$23 million a year; increases size of farm-road system from 35,000 to 50,000 miles. 1989: Texas FM system includes 41,855 miles of pavement; most extensive network of secondary roads in the world. 1989: Texas has completed 3,234 miles of interstate highways.

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Farm Organizations & Movements	U.S.		1802-1825: Agricultural societies and fairs flourish. 1838: Idea of a National Agricultural College promoted. 1840-1860: Interest in agricultural societies revived.	1850s: Farmers begin a cooperative to make cheese and market wool and tobacco. Farmers’ clubs. 1852: United States Agricultural Society organized. 1860: 941 agricultural societies in the U.S.	1867: National Grange organized. 1873-1876: Grange movement at its height. 1874-1880: Farmers’ Alliance movement begins.	1896: Height of Populist movement. 1902: Farmers’ Union started. 1910: Farmers’ Equity Union organized. 1911: First Farm Bureau formed in New York.	1919: American Farm Bureau Federation organized In Chicago, Illinois. 1920s: Farm organizations set up strong lobbies in Washington, D.C. 1920-1932: Cooperative movement spreads; Capper-Volstead Act of 1922 gives cooperatives legal standing. 1930: 11,950 cooperatives with 3 million members.	1934: Southern Tenant Farmers Union (STFU) formed to cope with sharecroppers displaced during New Deal.	1950s: 10,051 cooperatives with 7 million members. 1955: National Farmers Organization formed. 1960s: Commodity groups move to forefront of influence with Congress. 1966: Fair Labor Standards Act extended to include agricultural labor. 1970: 7,994 cooperatives With 6.2 million members.
	Texas	18th century: Catholic church promotes agriculture (farming and ranching) as a way to consolidate and civilize Native American populations.		1840s-1850s: German immigrants establish numerous voluntary agricultural associations.	1873: Formation of Patrons of Husbandry (Grange) in Salado. 1875 or 1877: Formation of the Farmers’ Alliance. 1877: Formation of Stock-Raisers’ Association of North-West Texas. 1881: Formation of Woolgrowers’ Association. 1886: American Mohair Growers Association forms in San Antonio. 1886: Independent Colored Farmers’ Alliance and Cooperative Union organized. 1890: R. L. Smith founds Farmers’ Home Improvement Society (Black) in Colorado County; self-help programs spread through Texas, Oklahoma, and Arkansas.	Early 20th century: Federated Women’s Clubs organization develops interest in rural life and programs to aid farm and ranch families; sponsors legislation. 1907: Texas Dairymen’s Association forms.	1920s: Cooperatives such as the Texas Wheat Growers and Texas Farm Bureau Associations attract membership because of ability to negotiate prices.		Post-WWII: Agriculturists continue memberships in national and regional organizations such as the American Farm Bureau Federation, National Farmers Union, and Texas and Southwestern Cattle Raisers’ Association, and commodity associations as a way to market products and promote political agendas.

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		18th Century	1801-1848	1848-1865	1866-1894	1895-WWI	1918-Depression	1930s-WWII	Post-WWII
Agricultural Information and Education ; Extension Work	U.S.	18th century: Civic and intellectual leaders form societies to promote agricultural, scientific, and commercial interests.	1810: First American agricultural periodical, the <i>Agricultural Museum</i> , begins publication. 1819: The <i>American Farmer</i> and the <i>Plough Boy</i> periodicals begin publication. 1820s: Agricultural periodicals begin to express rural issues. 1830-1860: Popular and agricultural education the most prominent rural issue of this period. 1840: About 30 farm journals in publication with circulation of more than 100,000. 1841: <i>Union Agriculturist</i> and <i>Western Prairie Farmer</i> start publication.	1862: Drive for agricultural education culminates in passage of Morrill Land Grant College Act.	1870s: Many state colleges of agriculture begin experimental work. 1875: Agricultural experiment stations established in California and Connecticut. 1887: Congress passes Hatch Act to improve agricultural efficiency; 15 states have formally organized experiment stations. 1890s: Development of secondary agricultural education in local areas and by state. 1890: Second Morrill Act broadens 1862 land-grant program and sets up funding for Black land-grant schools. 1893: 49 experiment stations exist under Hatch Act.	1906: Appointment of first county agricultural agent. 1909-1917: Boys’ and Girls’ club work underway. 1914: Smith-Lever Extension Act passes, establishing the federal-state extension service, a major step in direct education for farmers. 1917: Smith-Hughes Vocational Education Act passes.	1920: 31,000 students enrolled in agricultural courses. 1925-1945: Basic research done in land-grant colleges lays groundwork for second agricultural revolution. 1928: Future Farmers of America founded.	1935: Bankhead-Jones Agricultural Research Act more than doubles federal support of extension work. 1940: 584,000 students enrolled in agricultural courses.	1946: Land-grant college enrollment increases greatly as veterans enroll under G.I. bill. 1958: National Defense Education Act. 1970: 853,000 students enrolled in agricultural courses. 1974: Agreement between USDA and land-grant colleges establishes Council on International Science and Education. 1980s: Enrollments in colleges of agriculture drop in wake of farm crisis.
	Texas	18th century: Information about agricultural matters is available primarily from the Catholic Church, working through Franciscan priests at the missions.	1820s-1840s: Information about agricultural matters is available through nationally published magazines and newspapers, which are widely read.	1840s-1850s: Agricultural information available through German educational institutions that emphasize pursuits such as agriculture. 1857: <i>Texas Almanac</i> begins publication; includes articles and data about agriculture. 1858: Gilbert Onderdonk conducts pioneering work to develop fruits and vegetables acclimated to Texas; distributes products and information widely. 1858: Geological and Agricultural Survey of Texas.	1876-1907: Bureau of Agriculture, Insurance, Statistics and History collects and disseminates agricultural information. 1881: <i>Texas Stockman and Farmer</i> begins publication. 1883: <i>Farm and Ranch</i> begins publication. 1887: Texas Agricultural Experiment Station (TAES) established. 1888: TAES scientists conduct first research projects. 1889: First TAES field tests; Texas A&M begins sponsoring instructional farmers’ institutes.	1898-1915: Texas A&M-sponsored Texas Farmers’ Congress meets. 1900: T. M. Marks organizes forerunner to Four-H. 1903: Through Seaman A. Knapp, U.S. Cooperative Extension begins work in Texas near Terrell and Greenville. 1906: William C. Stallings becomes first U.S. county agent (in Smith County). 1912: Ms. Edna W. Trigg Milam County, becomes first woman county agent in Texas. 1914: Texas A&M University joins the Texas Agricultural Extension Service. 1915: Negro Extension Division organized. 1917: Vocational agricultural education introduced in white and black high schools.	1920s: Dairy cooperatives and associations and county agents inform dairymen about production standards.	1930s: Extension agents and Agricultural Experiment Stations disseminate information to agriculturists about soil conservation, food and fiber production, farm management and economics, and related topics; Four-H clubs remain active.	Post-1945: Four-H clubs remain active. 1947: Vocational agriculture departments in 631 high schools. Late 1940s-1970s: Agricultural research leads to development of grain sorghum varieties cultivated widely for cattle feed; chemicals and improved seeds increase production. 1965: Vocational agriculture departments in 1,022 high schools. Mid-1990s: Vocational agriculture departments in 1,011 high schools; 9 universities offer courses.

Agricultural Theme Study for Central Texas
Historic Context

The following sources were used in the compilation of Table 4-1:

Agricultural Marketing Service 1942:12-13; Campbell 1949:16-19; Carlson 1982; Cleaveland, et al. 2011:54-96; Danborn 1979; Dimitri, Effland, and Conklin 2013; Freeman 2004; Freeman 2010; Freeman, Dase, and Blake 2001; Johnson 1933; Lea 1957; Osgood 1957; Pool 1975; Smith 1999; Spratt 1983; Stahle and Cleaveland 1988:59-74; U.S. Department of Agriculture 2008a, 2008b, 2008c, 2008d, 2008e, 2008f, 2008g; U.S. Department of Commerce 1943, 1946, 1962. www.ers.usda.gov/publications/eib-economic-information-bulletin/eib3.aspx#.UVR13hykqfghttp://www.agclassroom.org/gan/timeline/ag_edu.htmhttp://www.agclassroom.org/gan/timeline/crops_livestock.htmhttp://www.agclassroom.org/gan/timeline/economic_cycles.htmhttp://www.agclassroom.org/gan/timeline/farm_tech.htmhttp://www.agclassroom.org/gan/timeline/farm_org.htm<http://www.agclassroom.org/gan/timeline/gov.htm><http://www.agclassroom.org/gan/timeline/transportation.htm>

SECTION 5. PROPERTY TYPES

SECTION 5. PROPERTY TYPE DEVELOPMENT

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INTRODUCTION

Agricultural Theme Study for Central Texas, Property Type Development discusses the built environment of agricultural properties. The following chapter describes agricultural properties as the three main areas or “zones.” The three zones are defined by the physical layout of an agricultural property and include:

- Domestic work zone
- Agricultural work zone
- Fields/pastures

An agricultural property is most readily understood when divided into these three zones based on the types of resources and their functions, and activities performed therein. The domestic work zone includes the main house and sometimes worker housing, as well as buildings, structures, and landscape features that support the domestic life of the people who live on the property. The agricultural work zone includes buildings and structures directly associated with the day-to-day management and operation of an agricultural property. The fields/pastures often make up the largest area of the agricultural property and constitute the areas where crops are grown or livestock grazes. All three zones, various combinations of the three zones, and/or multiple numbers of the same zones may be present on any given agricultural property. Each zone possesses its own distinct sets of buildings, structures, and land-use patterns. Circulation networks of internal driveways within an agricultural property typically connect the zones and link the property to public roads. This chapter includes definitions and explanations of each zone and aerial photography illustrating how the zones and features within the zones relate to each other. The various zones are outlined on the aerial photographs to illustrate approximate boundaries of each zone.

Following each description of these zones are discussions and illustrations of common resources found within each zone. Variations among farming, dairying, and ranching properties are noted within each resource type discussion. While properties may include more resources than those described in this chapter, the resources included are the most common on agricultural properties in Central Texas. Common resource types found in each zone are discussed and photographs of the resource types are included. It should be noted that this chapter includes broad categorizations of resource types and it is often difficult to differentiate among these types (such as the different types of sheds or barns). Therefore, it is recommended that the surveyor ask the property owner (if possible) about each building’s current and historical uses.

Understanding each zone and the resources found therein will greatly aid the historian in determining what agricultural activities took place on an agricultural property, particularly in instances where multiple agricultural activities have historically or are currently taking place. Coupled with the historical research conducted prior to and during fieldwork, this awareness can help historians survey, identify,

and evaluate agricultural properties in Central Texas and throughout the state using these same principles.

DOMESTIC WORK ZONE

The domestic work zone, as its name implies, is the residential area of an agricultural property. This zone includes built features that are associated with the home life of the property and provide support for human activities. Common types of resources found within the domestic work zone are:

- Main house
- Privy
- Garage and carport
- Domestic shed
- Cistern
- Well
- Windmill
- Well house and pump house
- Worker housing
- Chicken coop
- Storm shelter
- Smokehouse
- Landscaping features (including vegetation, fences, gates, paths, driveways)

ORGANIZATION

The activity within the domestic work zone is focused on the main house, the primary living space for the farmer or rancher. The organization of the other resources and features within the domestic work zone depends upon their function of the features and their proximity to the house and each other. The historian should look at the domestic work zone (and all work zones) in a holistic manner to try to determine how each resource is used and how it contributes to the overall functioning of the property.

The domestic work zone may be located near or have a vantage point of a public road and located near a reliable water source. A main formal entrance with a driveway often leads directly to the house, garage, and domestic work zone. The relative position of the domestic work zone on ranches and dairy farms also takes into consideration the location of prevailing breezes, ensuring that the residential area is upwind from the main work area, which is also known as the agricultural work zone. Additionally, ranches and dairy farms often have fencing surrounding the domestic zone to keep livestock away from the residential areas, and there are often fences separating the domestic and agricultural work zones.

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Examination of aerial imagery provides a good opportunity to understand the domestic zone and how it physically relates to the agricultural work zone and the pastures/fields. Three examples are shown below that illustrate how the domestic zone may vary among a farm, dairy farm, and ranch.



Figure 5-1. Aerial view of a farm on CR 367 in western Falls County, 2012. Source: Google Earth.

Figure 5-1 shows a portion of a farming property located on CR 367 near Westphalia in Falls County looking west. The domestic work zone (outlined in blue) on this farm is located close to and is oriented towards the public road. The main driveway leads from the road directly to the domestic work zone and the main house. The domestic work zone on this property appears to include a house, garage, driveway, and vegetation. The agricultural work zone (outlined in red) is to the rear of the domestic work zone. The fields and pastures zone surrounds the domestic and agricultural work zones and is outlined in yellow. The numbers on the figure above identify the following resources:

1. Main house
2. Garage behind the house
3. Unpaved driveway and trees

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Figure 5-2. Aerial view of Joe V. Bacon Farmstead and Allie Belle Horton Baker Dairy Farm, Bexar County, 2012. Source: Bing Maps.

Figure 5-2 shows an abandoned farm with a dairy barn that is located south of The University of Texas at San Antonio campus and on a level elevation adjacent to Leon Creek. Although the dairying operation ceased many years ago, buildings and landscape features are still extant that indicate the historic use of the land. There are two domestic work zones (outlined in blue) on this property – one includes the main house and the other includes worker housing. Each domestic work zone is surrounded by fencing and a driveway separates them. Both domestic work zones are located in close proximity to the agricultural work zone (outline in red). Both the domestic and agricultural work zones are surrounded by the unimproved pasture (outlined in yellow) for dairy cows, which is now heavily wooded. The resources within the domestic work zone include:

1. Main house
2. Stone pond
3. Domestic work sheds
4. Unpaved driveway separating the domestic work zones
5. Worker housing in a secondary domestic work zone
6. Unpaved driveway leading to the domestic and agricultural work zones

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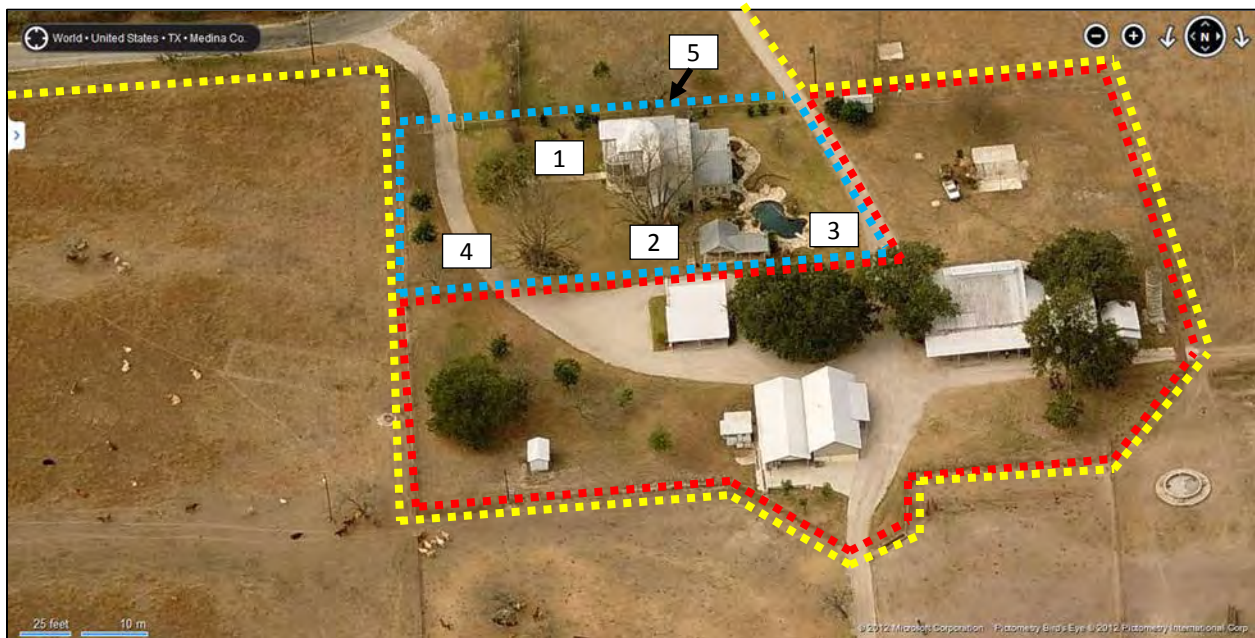


Figure 5-3. Aerial view of Henry F. Wurzbach Ranch in Medina/Bexar counties, 2012. Source: Bing Maps.

Figure 5-3 is a detailed view of the domestic and agricultural work zones on the Henry F. Wurzbach Ranch, a property located in both Medina and Bexar counties. Looking west, the image reveals the spatial relationships that are typical of the domestic work zone in relation to ranching operations. The domestic work zone (outlined in blue) is defined by the driveway and fence that encircle this area. The domestic work zone is directly adjacent to the agricultural work zone (outlined in red) and the pastures (outlined in yellow). Specific features within the domestic zone are identified by number and described below.

1. Main house with surrounding trees
2. Guest house
3. Pool
4. Main driveway into the property leading to the domestic zone
5. Fence separating domestic work zone from the public right-of-way

COMMON RESOURCE TYPES

The domestic work zones illustrated above include numerous resource types that are commonly found on farms, dairy farms, and ranches in Central Texas. The following section describes and provides photographs of the most common resources found within the domestic work zone on Central Texas agricultural properties.

Main House



Figure 5-4. This main house is a two-story, side-gable Folk Victorian residence located in Central Texas. Built ca. 1890, the main house exhibits stone and timber construction topped with a metal roof. Distinctive features include spindlework detailing on the full-width porch, six-over-six double-hung windows, and glazed paneled front door with sidelights and transom.

The main house is a feature common to domestic zones on agricultural properties. The form, plan, and style of the main house are dependent on national, vernacular, and cultural trends and styles, availability of materials, and cost. Common forms and plans in Central Texas include L- and T-plans, hall-and-parlor, central passage, massed, bungalow, and to a lesser extent, I-houses. Common roofing structures include side-, front-, and cross-gable, pyramidal, and hipped. In general, residential housing in the United States prior to World War II exhibited pier-and-beam foundations, while after the war concrete slab foundations became commonplace. The low cost of concrete and elimination of the time necessary for floor framing contributed to the popularity of concrete slab foundations (McAlester 1984: 34).

In general, due to cost and availability of materials, architectural styles on rural properties tend to be more modest than residences in urban areas (Granger and Kelly 2005: 6.143-6.144). The styles seen in Central Texas include, but are not limited to, National Folk, Queen Anne, Folk Victorian (*Figure 5-4*), Craftsman, Prairie, Minimal Traditional, and Ranch. The architectural style or method of construction of the house may also reflect the influence of ethnic groups or indicate when the agricultural property was established. For example, the use of *fachwerk* construction for a house may indicate that a farm was established by people of German or Slavic origins during the nineteenth century (*Figure 5-5*). Other

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extant examples of main houses in Central Texas are indicative of German, Czech or Slavic, Hispanic (Spanish), Latino (Mexican), and Anglo-American influences and building traditions; however, others also may exist, as noted in the “Historic Farms and Ranches of Bexar County, Texas” National Register nomination (Dase 2010: F-45-46). Hispanic influences on main houses include flat roofs and courtyards. Anglo-American influences may include box frames with board and batten siding, gabled and hipped roofs, and central-passage, massed, or L- and T-plans (*Figures 5-6 and 5-7*). For more information on the history of settlement in Central Texas, see Section 4, Historic Context.

It is important to remember that the main house extant on the property at the time of a survey may not always accurately reflect the original establishment of the property. The original main house may have been demolished and replaced with a newer house, often seen on a property where the main house dates to the mid-twentieth century and the outbuildings date to an earlier period. In this case, the house may reflect an era of prosperity when the owners could afford to build a newer house. Sometimes the original house is abandoned but not demolished when a new house is built. The original house may then become a storage facility for the property. Property owners also reuse materials from older outbuildings to build new structures, including the main house. It is also common to see one or more additions on the main house, constructed in times of prosperity or as the family grew.

ADDITIONAL PHOTOS



Figure 5-5. Ca. 1850 one-and-a-half side-gable residence with stone rear-shed addition. Fachwerk is on the upper-half of the gable section with its timber framing and vertical and diagonal bracing.

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Figure 5-6. Ca. 1920 two-story, cross-gable residence with modest Folk Victorian and Craftsman style influences, indicating that the house may have been remodeled after its initial construction. Folk Victorian features include window hoods and six-over-six double-hung windows on the porch and side-gable end. Craftsman features include low-pitched roof, exposed eaves, and square columns supporting a wide unornamented entablature.



Figure 5-7. Ca. 1945 Minimal Traditional farm house. These and Ranch-style houses were built in large numbers as returning veterans used GI Bill funds to purchase their first homes on their farms and ranches during the post-World War II period.

Privy



Figure 5-8. Double privy with a side gable roof.

A privy is a very small, most often wood-sided, gable- or shed-roof building separated from the main house that provides restroom facilities for the property (*Figure 5-8*). It can also be constructed of stone or brick and exhibit a pyramidal roof. It is usually located to the rear of the main house, out of public view. Prior to the late 1930s, the privy was a fairly common part of an agricultural property's landscape and domestic work zone. However, with the rural electrification movement in the late 1930s, electrified well pumps made water supply to houses more common and allowed for installation of bathrooms in houses. Increasingly the restroom facilities became interior rooms in the main house rather than in an outdoor privy. For further information on the rural electrification movement and other agricultural improvements in the 1930s, see Section 4, Historic Context.

Garage and Carport



Figure 5-9. Ca. 1940 detached garage with metal siding and roofing.

Garages and carports may also be found within the domestic work zones of agricultural properties, either to the rear of or attached to the main house. As noted in Jonathan E. Sager's thesis *The Garage: Its History and Preservation*, garages first appeared around the turn of the nineteenth century and in rural areas they were most often constructed as extensions of existing sheds, stables, or machine shops. Early twentieth-century garages are frequently single-stall, stand-alone structures. Portable, pre-fabricated metal garages first became available in the 1910s (Figure 5-9). Garages built before World War II are often separate structures from and to the rear of the main residence. Only a small number of these pre-war garages are attached or semi-attached to the main house by a breezeway or covered walkway. If not constructed of pre-fabricated metal, these garages often exhibit wood siding, gable roof, and a wood paneled single stall door. Most post-World War II garages are attached and integrated in the main residence. Two-stall garages were increasingly common during this period and garages in general became prominent features of the main house, exhibiting their own design and aesthetic rather than simply functioning as automobile storage (Sager 2002: 7, 8, 10, 16, 32).

Carports were first introduced in the 1930s and became increasingly popular in the 1940s and 1950s. Design and materials for carports vary greatly and range from simple metal roofing supported by metal posts to gabled roofs with brick piers (Figure 5-10). Like main houses and garages, carport architecture tends to reflect national and regional architectural trends and styles of a particular era. Carports can be stand-alone structures or attached to the main house.

ADDITIONAL PHOTO



Figure 5-10. Timber-frame carport with gabled roof. The carport is attached to a single-stall garage.

Domestic Shed



Figure 5-11. Ca. 1920 timber-frame domestic shed. It consists of horizontal wood siding, a fixed-sash multi-glazed window, gabled metal roof with exposed eaves, and a plywood door.

Several types of sheds may be found in the domestic work zone, but they all serve the same general function – storage. Since sheds in the domestic work zone can be used for any need that the family may have, these sheds can provide storage for many types of items, such as wood, the family’s tools, and other possessions (*Figures 5-11 and 5-12*). The historian should observe the domestic shed’s location within the domestic work zone to try to determine its use. For example, a shed directly adjacent to the vegetable garden could be used as a shed for garden tools. Talking to the property owner, if possible, is the most effective way to reveal the use of a shed in the domestic zone.

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ADDITIONAL PHOTO



Figure 5-12. Ca. 1920 domestic work shed with gable roof and wood siding.

Cistern



Figure 5-13. Above-ground stone cistern.

Cisterns are cylindrical or rectangular structures that collect rainwater for household use (Brooks and Jacon 1994: 58). They can be constructed underground or as above-ground features. They are commonly located near the main house, often adjacent to a windmill, but they can also be located in the agricultural work zone and fields and pastures to provide water for livestock. Cisterns may be fed from the roof and eaves associated with the main house, and the water in the cistern may be used for bathing, cleaning, and drinking, as well as for livestock. On ranches and farms, milk rooms are sometimes attached to cisterns at the base and used by the property owners for cooling milk. For the discussion on milk rooms and milk houses, see the *Agricultural Work Zone* discussion below. Early underground cisterns in Texas in the nineteenth century are crudely constructed, hand-dug, and lined with mortar or other impervious materials such as brick or stone, which frequently are then plastered. Few extant examples of these types of cisterns are found within Central Texas. In contrast, above-ground cisterns are prevalent in Central Texas. Early above-ground cisterns commonly are masonry and rest directly on the ground (*Figure 5-13*) or they may be wooden and elevated on wood supports. In such a case, cypress is a favored material. The size of the cistern is dependent on the needs of the residents as well as the size of the property and needs for the agricultural activities at the time of construction (Granger 2005: 6.52). By the 1920s, metal cisterns became more popular throughout Texas (*Figure 5-14*).

ADDITIONAL PHOTO



Figure 5-14. Ca. 1925 metal cistern elevated off the ground by wooden supports.

Well



Figure 5-15. This concrete well was constructed ca. 1920 and is topped with a concrete cap and metal hand crank.

Wells are usually located close to the main house (*Figure 5-15*) and away from septic systems associated with the house and from the agricultural work zone (to avoid contamination). Water drawn from wells was used for drinking, bathing, and cleaning purposes. Early wells were hand drawn with a rope and bucket, often termed artesian wells due to the ability of the aquifer or watershed to replenish the water in the well without a pump. Most wells by the late nineteenth century had mechanical pumping operated by hand or with a windmill. Wells where the water was supplied by motors powered by gas or electricity did not appear until the 1920s. Early wells were shallow and hand-dug while later wells were drilled. Drilled wells are the deepest wells and the most sanitary, extending 100 to 200 feet deep and through impervious material, thereby nearly eliminating the risk of contamination (Granger 2005: 6.519). Early wells have rock and masonry walls topped with a hand crank while later wells are lined with concrete and often topped with a metal cap or seal. Wells may also be topped with a gabled or pyramidal covering (*Figure 5-16*).

ADDITIONAL PHOTO



Figure 5-16. This well has a pyramidal covering with a pulley system to retrieve water; note the cistern adjacent to it.

Windmill



Figure 5-17. This photo shows a windmill with damaged metal rotating vanes and metal tower.

Windmills are located in all three agricultural zones and can be used to pump water and generate electricity (*Figure 5-17*). As the wind turns the blades, the gearbox at the top of the structure transfers the motion to a long pole that pumps water from below the ground. Windmills pumping water are most often situated near or directly over a well or pump house (*Figure 5-18*). For more information on well and pump houses, see the corresponding well house and pump house resource type discussion below.

Although windmills have been in use since the ninth century in parts of the world, the American-style windmill was not invented until 1854. Originally constructed to pump water, these early windmills are tall wooden towers with wooden crossbars topped with rotating wooden blades or vanes. Larger early windmills have iron-framed blades covered with sailcloth (Baker 1985: 8). Windmills generating electricity were used as early as the 1880s in Ohio and in the 1930s operated at 12 or 32 volts and used lead-acid batteries that were located in specially built sheds (Delco plants) for energy storage. The rural electrification movement in the late 1930s eliminated the need for virtually all electricity-generating windmills except in the most remote areas (Shepherd 1990: 33 and 37).

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Two types of windmills are most prevalent in the United States: sectional-wheel and solid-wheel. Sectional-wheel windmills have sections of blades on the wheel that pivot to respond to wind speeds and pressure. Solid-wheel windmills are rigid and the entire wheel, instead of the individual sections, pivots (Baker 1985: 10). Although steel windmills were developed in the 1880s, they did not come into widespread use until the 1920s. After World War II, wooden windmills were no longer manufactured since steel windmills were easier to maintain, longer-lasting, and came with self-oiling capabilities. More reliable electrical pumps are now more common, but abandoned wooden and metal windmills in varying stages of disrepair are present in Central Texas.

ADDITIONAL PHOTO



Figure 5-18. This metal windmill also has a metal-sided well house at its base.

Well House and Pump House



Figure 5-19. This well house is located adjacent to a windmill. The concrete well house was built ca. 1925 and is topped with a gable corrugated sheet metal roof.

Well and pump houses are small buildings that completely enclose a well or pumping equipment. Early well and pump houses exhibit stone or brick construction with a gabled roof while later examples in the 1920s and after World War II tend toward utilitarian design consisting of wood or metal siding and a gabled roof or concrete block with metal roofing (*Figures 5-19 and 5-20*).

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ADDITIONAL PHOTO



Figure 5-20. Ca. 1900 pump house. Exhibits thick stone walls with a small square window and entrance. Since its initial construction, concrete placed on top of the stone walls has raised the height of the pump house.

Worker Housing



Figure 5-21. Ca. 1910 worker housing located in the fields and pastures.

Worker housing is for the workers and laborers of the property including tenants and sharecroppers. It is most often located in the agricultural work zone. It may also be found in a secondary domestic work zone and fields and pastures (*Figures 5-21 and 5-22*). Although worker housing is found on ranching, dairying, and farming properties, it is most prevalent on farms due to the amount of labor needed for crop cultivation. Ranchers may also use abandoned worker houses to store hay and feed for livestock in more remote locations on ranches.

On Texas agricultural properties, there is a hierarchy of farmers, with owners at the top of the economic system, followed by tenant farmers, and sharecroppers near the bottom of the social ladder.¹ This social ranking is reflected in the residential buildings on an agricultural property: the main house is the largest house and the tenant farmers' houses are larger than the sharecroppers' houses. Usually, these worker houses are grouped near each other, and smaller domestic work zones surrounding these resources may be present. Depending on the permanency of the employee, worker housing might also have associated fenced areas for gardens and poultry, and privies might also be present. Additionally, worker houses are

¹ Migrant workers were considered at the bottom of the social system during the twentieth century; however, farmers' utilization of migrant workers is not generally seen on individual farms since they often slept in their vehicles and tents on the farmer's land, at tent camps, and in government-run housing complexes (Montejano 1987: 169-177; Greigo y Garcia 1996: 45-57).

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usually devoid of or have minimal decorative detailing and, in general, have modest forms such as hall-and-parlor, shotgun, and small Minimal Traditional (side gable with projecting ell) forms. As noted in the main house resource type discussion, pier-and-beam foundations are common prior to World War II; postwar houses exhibit concrete slab foundations.

ADDITIONAL PHOTO



Figure 5-22. Employee house at Joe V. Bacon Farmstead and Allie Belle Horton Baker Dairy Farm, Bexar County.

Chicken Coop



Figure 5-23. This chicken coop is a common example seen in Central Texas. The coop is constructed of metal siding with a shed roof and includes a fenced yard to contain the chickens.

Chicken coops, also known as poultry houses, are commonly found on Central Texas agricultural properties because raising chickens resulted in the consistent production of eggs for the family. Due to the daily need to retrieve eggs, the coop was often placed in proximity to the rear door of the main house. The chicken coop is often a long, narrow building with a shed roof (*Figure 5-23*). They are typically built a foot or two above the ground to allow for cooler interior conditions during the summer months and to keep predators such as snakes, raccoons, rats, and foxes out of the coop. Windows or doors are often used for ventilation, although windows are more common on Central Texas chicken coops. They are typically wood- or metal-sided buildings with recycled or inexpensive materials (Scoates 1938: 32-36). The coops are often oriented to the south or the east for morning sun exposure (Scoates 1938: 32; Granger and Kelly 2005: 6.367).

Storm Shelter



Figure 5-24. Storm shelter is located in front of the residence. Source: TxDOT Environmental Affairs Division.

Domestic work zones across Central Texas and in tornado-prone areas of the state may have storm shelters (*Figure 5-24*). These resources are typically dug into the side of a hill or directly under the surface of the domestic work zone yard. While the earliest storm cellars were typically holes in a side of a hill, the resource type described herein are the storm cellars that are structures built into the ground.² A hillside or embankment storm shelter was typically built adjacent to or into the side of a hill, and fill material would cover all sides of the structure except the door, which would be vertical or inclined. A surface storm shelter was built directly under the ground level and had to be dug by hand or machinery. The storm shelter was constructed in the excavated area several feet below the surface of the ground. The top of the storm shelter typically had a concrete pad on top of it. Both hillside and surface storm shelters were constructed of a variety of materials, but often they were constructed of reinforced concrete or concrete block, which was typically anchored into the ground. Vent pipes provided air to those inside (Eakins 2013: n.p.). They were typically located within a few hundred feet of the house for quick access during storm events and are most often seen in the rear or side yard.

² If a dirt storm cellar is found, confirm with the property owner, if possible, that the resource is a storm shelter rather than a root cellar, as these resources can look similar. Also note that root cellars were sometimes used as storm shelters if they were large enough for the family.

Smokehouse



Figure 5-25. Ca. 1880 smokehouse. The building exhibits masonry construction with a corrugated metal roof and a small opening on the gable-end for ventilation.

Smokehouses can be found on any agricultural property but are most often located on farms and ranches in the domestic or agricultural work zones (*Figure 5-25*). Traditionally used to smoke and preserve meat, the smokehouse became somewhat obsolete after the 1930s with the advent of electrification and refrigeration.³ Smokehouses can exhibit a variety of materials including wood, brick, concrete block, and stone with gable or pyramidal roofing. They are usually small, windowless, one-story square or rectangular buildings set apart from other buildings due to the potential for fire. The only ventilation would be a chimney or small openings in the siding, stone, or brick. Smokehouses are often associated with German and Czech immigrants and therefore would be more prevalent in the southern part of Central Texas.

³ Smokehouses are still used today by hunters for smoking venison and sausage; however, modern smokehouses are often small, windowless sheds that are used once or twice a year for smoking meats.

Landscaping



Figure 5-26. Domestic work zone exhibiting tree cover and stone fencing. Fields and pastures zone is in the foreground.

Landscaping in the domestic zone may exhibit a variety of features including one or multiple stands of trees, hedges, ornamental or vegetable gardens, fencing, walls, paths, and driveways (*Figure 5-26*). Tree cover is usually centered on the main house, deliberately planted at this location to provide shade in the hot summer months (*Figure 5-27*). Some tree cover may also be present around the worker housing. If a main house is no longer present on an agricultural property, often a stand or ring of mature trees located near the main driveway indicates the location of the no longer extant residence. Trees may also line the main driveway, creating an allée from the public road to the main house. Hedges or bushes may be present on the property and function as ornamental vegetation as well as lines of demarcation between zones. Rows of hedges or bushes can surround the main house and/or the entire domestic work zone, creating a fence-like physical separation from other work zones (*Figure 5-28*). Small vegetable or ornamental gardens also can be found to the rear or side of the main house. Fences also are seen in the domestic work zone, particularly on agricultural properties that raise livestock.

The domestic work zone and the agricultural work zone are often separated by fencing that may be decorative in nature and constructed of wood, stone, wire, or wrought iron (*Figures 5-29 and 5-30*). On ranches, the fence also functions as a physical barrier that keeps livestock grazing on associated lands away from the main house and support buildings. The gate allowing access into the domestic work zone often extends to the rear or side entrance of the main house and completely bypasses the formal front entrance of the dwelling. Intermediate gates and cattle guards may be located on a ranch between the

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main entrance and domestic work zone, especially if the main house and domestic work zone are secluded within the property (*Figure 5-31*).

Usually an agricultural property will exhibit one main driveway (dirt or gravel and only sometimes paved) leading from the public road to the main house and agricultural work zone (*Figure 5-32*). Ranch entrances (and to a lesser extent dairy farms) may exhibit features including metal or wooden gates, masonry walls or piers, decorative metalwork above the driveway, cattle guards, and additional landscaping. Ranch gate entrances present varying degrees of complexity and ornamentation that can reveal much about the tastes and individuality of their owners. Gates are typically set back from the public road and have angled fences of wood, masonry or metal construction (*Figure 5-33*). These features distinguish the entrance as a distinctive physical element and foster a sense of formality. Secondary gravel or dirt drives and two-track dirt paths are often seen within the property, providing access for vehicles and farm machinery between zones and into the fields and pastures. Pedestrian paths (dirt or gravel) connect the zones and provide access between the zones for the property owner and workers. A concrete sidewalk or path may lead from the main driveway or parking area to the main house. See *Figures 5-1, 5-2, and 5-3* for aerial photography showing circulation networks within the domestic work zone.

ADDITIONAL PHOTOS



Figure 5-27. Note tree cover around main house.

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Figure 5-28. Hedgerow delineating domestic work zone from fields and pastures zone.



Figure 5-29. Stone fence with stone piers separating the domestic work zone from the public road (not shown).

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Figure 5-30. Wire fencing with gate and metal posts surrounding a domestic work zone.



Figure 5-31. Cattle guard and gate at entrance to domestic work zone.

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Figure 5-32. Driveway leading to the main house from the public road. A barbed wire fence and tree line on left side further delineates the domestic work zone.



Figure 5-33. Main entrance gate with masonry walls and piers and wooden fencing.

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Other Domestic Work Zone Resources

There are other resources that may be found within the domestic work zone; however, they are not as common as those outlined above. Some of these less common resources are outlined in *Table 5-1* and photographs of some of the resources are provided below.

Table 5-1. Other domestic work zone resources.

Resource Type	Function
Detached root cellar	To store preserved food for the residents (<i>Figure 5-34</i>).
Canning/food preparation building	To prepare, can, and preserve food.
Summer kitchen	To cook food for the residents (separated from the main house in order to reduce fire hazard and to avoid overheating the main house).
Ice house	To store ice for residential purposes.
Man-made pond	For the residents' recreational use (<i>Figure 5-35</i>). When located in the fields and pastures, the man-made pond is typically used as a stock tank for livestock (see the Fields and Pastures section below).

OTHER DOMESTIC WORK ZONE RESOURCE PHOTOS



Figure 5-34. Detached root cellar.

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Figure 5-35. Man-made pond, which can also be located within the fields and pastures of an agricultural property and used as a stock tank.

AGRICULTURAL WORK ZONE

The agricultural work zone includes built features associated with the work life of an agricultural property and provides support for the day-to-day management and operation of the agricultural activities. Common types of resources found within the agricultural work zone are:

- Barn
- Work shed
- Grain storage structure: silo, corn crib and grain bin
- Milk room/milk house
- Corrals, pens, and loading chutes
- Dipping vat
- Stock tank and water trough
- Self-feeder

See *Table 5-2* for more information regarding these common resource types and on which agricultural properties they generally are located.

ORGANIZATION

The agricultural work zone is usually located close to the domestic work zone, mainly to allow workers easy access to both areas. This zone is also located adjacent to the fields and pastures so equipment and/or feed can be moved directly into the fields and pastures zone. The agricultural work zone is also typically located near public roads for ease in loading, unloading, and transporting goods/livestock to and from market areas. While the domestic work zone has built features that are similar regardless of the type of agricultural activity on the property, the built environment in the agricultural work zone will vary by agricultural activity. The zone and its activities may also change over time, and multiple agricultural activities may be present on the property at the same time. There also may be secondary residences used for tenant or worker housing.

Between the resources in the agricultural work zone, there is commonly an internal network of driveways. A driveway usually connects the barn and/or equipment shed directly to the public road and the fields. Generally, the driveway connecting the agricultural work zone and public road does not go through the domestic zone. As noted in the domestic work zone discussion above, the agricultural work zone is usually downwind from the domestic area. Whereas most of the domestic work zone is often a defined space enclosed by a fence, the agricultural work zone presents a less formal grouping of buildings and structures. It is usually not enclosed by a fence; rather, it is bound by the fields or pastures and driveways.

The following aerial photographs illustrate the different types of agricultural work zones that can be found on an agricultural property in Central Texas.

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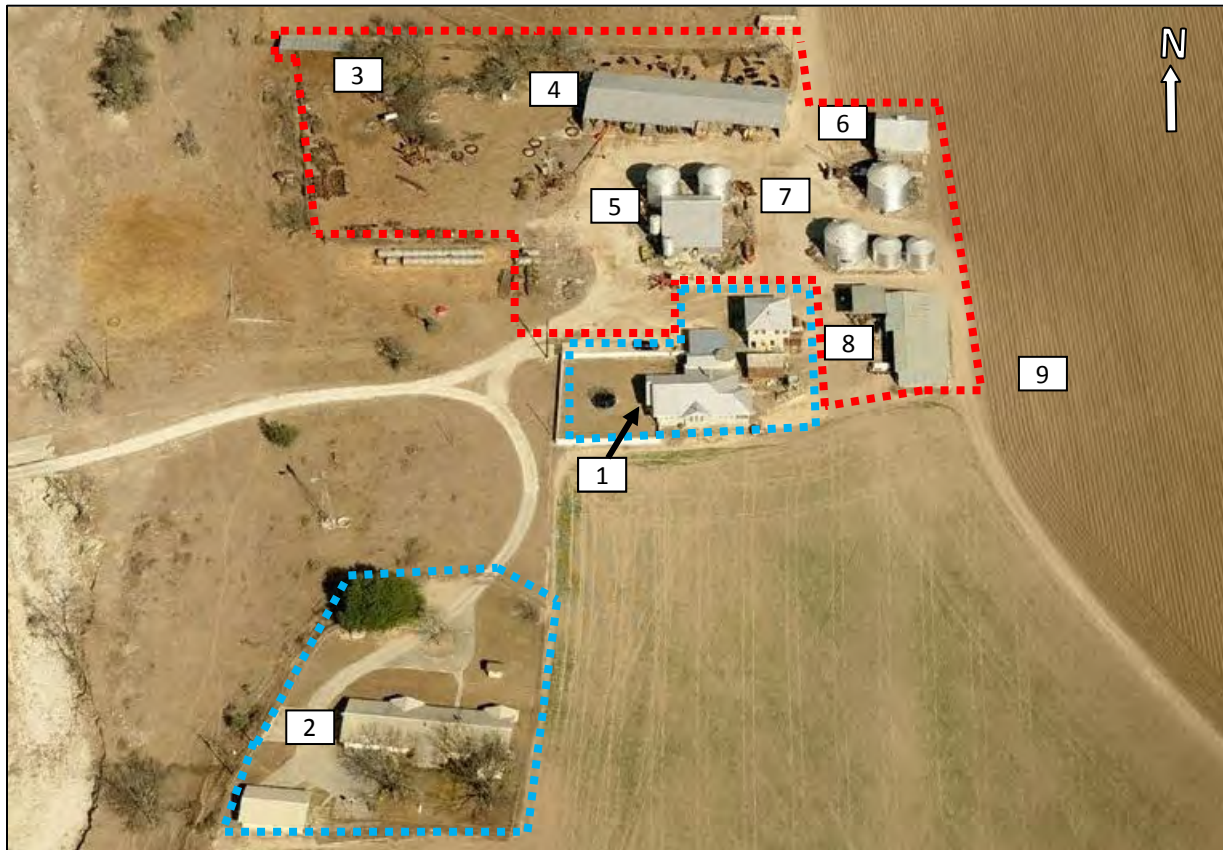


Figure 5-36. Aerial View of the Stolte Farm in Medina/Bexar counties, 2012. Source: Bing Maps.

Figure 5-36 depicts a portion of the Stolte Farm, which extends into Bexar and Medina counties, showing two domestic work zones (outlined in blue), the agricultural work zone (outlined in red), and the fields and pastures zone. This agricultural property illustrates how multiple farming activities often are undertaken simultaneously on a single property. This property has farming and ranching activity and a large agricultural work zone to accommodate the structures associated with the farming and ranching operations on the property. Specific features are identified by number and described below.

1. Historic domestic work zone
2. Secondary domestic work zone with 1960s house, garage, and other ancillary buildings; note the fence to the east and south that separates this area from associated fields
3. Loafing shed
4. Animal shelter
5. Non-historic-age metal grain bins
6. Wood-frame barn near non-historic-age metal grain bins
7. Dirt driveway providing access among resources within the agricultural work zone and to the domestic work zone.
8. General purpose barn with residence (likely worker housing) on the second floor
9. Cultivated fields adjacent to the agricultural work zone

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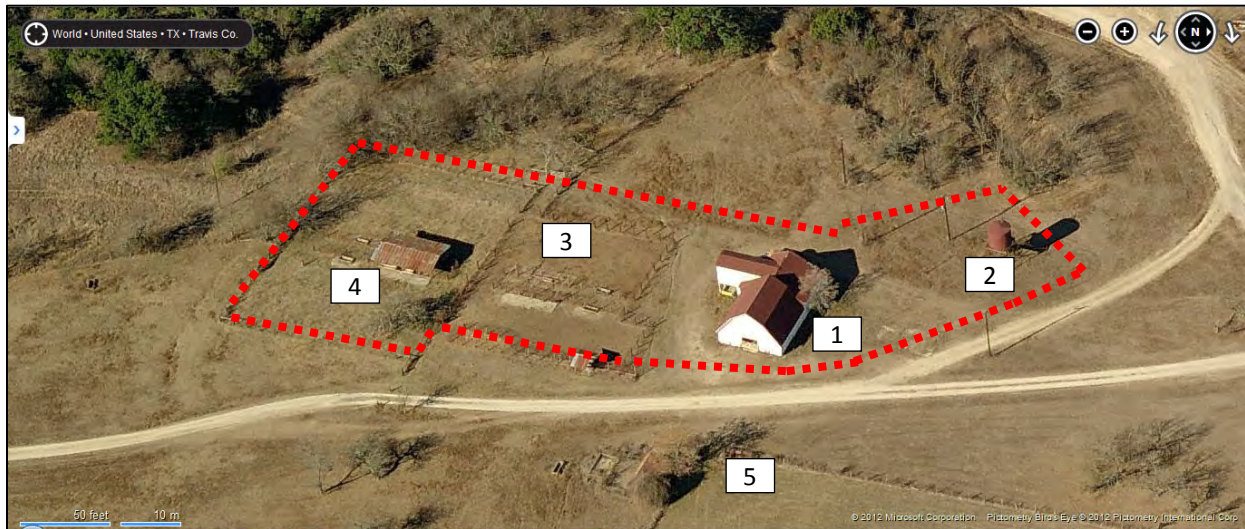


Figure 5-37. Aerial view of probable dairy farm along FM 969, Travis County, 2012. Source: Bing Maps.

Figure 5-37 shows an image of a farm with an apparent dairy barn that is located on an elevated plateau north of the Colorado River and adjacent to FM 969 approximately five miles from downtown Austin. This aerial image depicts the agricultural work zone (outlined in red) and a portion of the internal road system leading to a gambrel-roofed barn and working pens to the south of the barn. Sheds are located to the east and south within pasture areas. The road eventually leads through the fields and pastures zone to an earthen stock tank and lower pastures located adjacent to the Colorado River.

1. Gambrel-roofed barn
2. Metal tank on stand likely used for fuel storage
3. Fenced corral
4. Shed in fenced area
5. Field with fencing separating it from surrounding areas

COMMON RESOURCE TYPES

There are many common resource types within the agricultural work zone found on farms, dairy farms, and ranches in Central Texas. The following section will describe and illustrate the common resource types listed in *Table 5-2*.

Table 5-2. List of common resource types.

Common Resource Type	Farm	Dairy Farm	Ranch
Barn	X	X	X
Work shed	X	X	X

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Table 5-2. List of common resource types.

Common Resource Type	Farm	Dairy Farm	Ranch
Grain storage structure			
Silo	X	X	X
Corn crib	X	X	X
Grain bin	X	X	X
Milk room/milk house		X	
Corrals, pens and loading chute		X	X
Dipping vat		X	X
Stock tank and water trough		X	X
Self-feeder		X	X
Windmill*	X	X	X

*Previously discussed in the Domestic Work Zone discussion above.

Table 5-2 illustrates the type of agricultural property where common resource types are *likely* to appear. It is important to remember that a property may exhibit multiple agricultural activities, or its current agricultural activity may not be the same as its historic activity. Resources on agricultural properties are also often abandoned or reused and adapted for new functions. For example, it is possible that a farm may also have self-feeders or loading chutes. These can indicate that the farm historically may have had ranching activities, or ranching is currently occurring alongside farming activities.

Barn



Figure 5-38. Ca. 1910 dairy barn with side room.

The most recognizable resource type found on a farm is a barn (*Figure 5-38*). Generally located in the agricultural work zone, barns can exhibit an array of types, forms, sizes, and functions. Some barns reflect the heritage of an ethnic group (such as stone barns commonly found on German immigrants' farms in Central Texas) while others can be simple utilitarian buildings. The type and size of the agricultural activities on the property and the function that the barns serve also influence the barns' form.

In his book *Barns*, author John Michael Vlach categorizes some barn forms according to the number of cribs (also known as stalls and pens) and location of the main doors to the barn.⁴ Since the interior floor plan of barns is rarely accessible during surveys, the location of the main doors is more easily identified than the number or orientation of cribs. This is especially true when visibility or right-of-entry to a property is limited. Therefore, barns can be characterized as side-entry or transverse (gable-entry) barns based on the location of the main doors. The side-entry barn has the main bay doors on the side of the building and has one or more cribs on the interior (*Figure 5-39*). Side-entry barns often have livestock

⁴ John Michael Vlach's book *Barns* divides the United States into regions, and he notes that East Texas barns should be categorized with barns found in "The Lowland South" (the states along the coast from Maryland to Louisiana). West Texas barns are grouped in the "Southwest" (Arizona, New Mexico, and Texas) and are more appropriate for a desert landscape. Barns in Central Texas are more identifiable with "The Lowland South" barns.

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pens that are opened and covered with a full-width shed roof on one side or both sides of the building.⁵ When the main bay doors are located on the gable end of the building, the barns often have an aisle that traverses the barn from gable end to gable end with cribs on one or both sides of the aisle. These are referred to as transverse barns (*Figures 5-40 and 5-41*). The cribs can be used for animals or large equipment, or they can be enclosed to create small rooms for feed, shop tools, harnesses, or tack.

Both side-entry and transverse barns may have a loft used for storing hay or other supplies; however, lofts are more commonly found on transverse barns. Both barns may also exhibit a large opening called a hay door in the upper gable end. Often a hay hood extends over the large opening where a pulley system is attached to load hay into the barn. The hood also protects the hay door from the elements (Pennsylvania Historical and Museum Commission).⁶

Most nineteenth- and early twentieth-century agricultural properties will have at least one barn within the agricultural work zone. On farms and ranches, barns typically tend to be general purpose barns or barns that house horses/mules.⁷ The general purpose barn (termed as such by Daniel Scoates, author of the 1937 publication *Farm Buildings*) provides space for work animals, a few dairy cows, and/or other livestock, as well as some farm equipment (Scoates 1937: 31). Both the horse/mule barn and general purpose barn can range in size from small one-story structures to large two-story or more structures. According to Scoates, these (and all) barns could be banked into the side of hill, have open bays, or be completely enclosed, and they could have a variety of roofing structures including gable, hip, and gambrel. The barn may be clad in vertical and horizontal wood or metal siding with wood or metal roofing material. Depending on the size of the barn and its function, it may exhibit a range of doors. Large wood or metal sliding- and double-doors are common on barns. Smaller openings, called pitching doors and windows, may also be visible on a horse/mule barn and are used to pitch hay into the barn from outside. The purpose of the horse/mule barn is to house the work animals of the farm, which are used to pull plows, or are used to house other equipment, such as bridles and saddles. These barns often have lofts above the cribs to store hay and grain. They also tend to have few windows; however, when windows are present, they are placed near the top of the wall (Scoates 1937: 15). On ranches, large shearing barns may be used for sheep and goats, although such activities also could take place in adjoining pens or off-site shearing facilities. Besides providing a protected area to shear the animals, these barns often contain space to store equipment associated with shearing. It should be noted that some ranches might not have any livestock barns due to the area's mild weather. If a barn was necessary and the rancher did not want to spend much money on its construction, a modest shed or barn or even a temporary structure would be erected to shelter the animals.

⁵ For further information on barns, their forms, and their interior layout, see Vlach's *Barns* and Allen G. Noble and Richard K. Cleek's *The Old Barn Book: A Field Guide to North American Barns and Other Farm Structures*.

⁶ The hay door and hay hood, as well as the pulley system, are seen on many types of barns in Texas and Central Texas including horse/mule barns, hog houses, cattle barns, and general purpose barns. They may also be features seen on a stand-alone hay barn.

⁷ Farms may also have ancillary barns, which tend to be smaller in size and serve different functions from the general purpose barn.

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Most dairy farms will have one main dairy barn and smaller support barns including hay barns. The dairy barn is the defining feature found in the agricultural work zone on a dairy farm (see *Figures 5-38 and 5-42*). Because of strict state and federal regulations, most dairy barns reflect requirements that they have surfaces appropriate for sanitation, good drainage, light and sunshine, ventilation, and feed storage. Three common types are the one-story barn, two-story barn with overhead hay storage, and small milking barn associated with or incorporated in a feeding barn (Scoates 1937: 17; Thomas et al. 1949: 242).⁸ Transverse barns are most common, and gambrel roofs are most often associated with dairy barns, although gable roofs are also found. Rooftop ventilators along the roof ridge circulate air in and out of the barn. Wood, masonry, and brick are common building materials. Direct sunlight assists with killing bacteria and shines through screened windows to illuminate the interior. Since sanitation is extremely important for dairy farming, the dairy barn will exhibit a large number of windows compared to barns found on farms and ranches. Interior and exterior doors are wide and high enough to accommodate the passage of animals and vehicles (Scoates 1937: 19; Thomas et al. 1949: 245-250, 290-291). The interior of the barn will likely have concrete floors since they are impervious, easily cleaned, warm, and durable (Scoates 1937: 19; Thomas et al. 1949: 243). A gutter incorporated in the floor allows for complete drainage of the barn. Interior spaces include mangers, stalls, and alleys. Walls and ceilings have a smooth, often painted, surface. Dairy farms will also have one- or two-story hay barns. Topped with a gable or gambrel roof, the barn usually has metal or wood siding and exhibits the hay door, hay hood, and pulley system for loading hay into the barn.

While barns on ranches and farms (and smaller barns on dairy farms) may look similar, it is important to look at the entire property and the historical research completed on the area to determine the agricultural use of a barn. Since dairy barns are usually quite large and have a distinctive appearance, it is likely that these barns can be more easily identified; however, it is important that the historian look at the property holistically to determine the barn's historic and current use.

⁸ Much of the information summarized in this discussion also appears in Reaves and Pegram, 1956.

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ADDITIONAL PHOTOS



Figure 5-39. Side-entry barn on a ranch with livestock pens on the building's front elevation.



Figure 5-40. Transverse general purpose barn with attached livestock pens. Barn exhibits vertical wood siding with a sliding door and capped with a gabled metal roof.

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Figure 5-41. Gambrel roof transverse barn with attached livestock pens and a side room on a ranching property.



Figure 5-42. Gambrel roof side-entry dairy barn. The barn exhibits masonry and wood construction, a hay door with hay roof, small square windows for light and ventilation, and a timber frame shed roof side room.

Work Shed



Figure 5-43. Ca. 1930 equipment shed.

Work sheds are common resource types found on agricultural properties in Texas and Central Texas. Properties will exhibit one or more sheds of different materials, forms, types, and functions. Although domestic sheds and work sheds may have the same form, they will often differ in size and function. Work sheds support the agricultural activity whereas domestic sheds mostly support the domestic work zone. As such, work sheds are often larger than domestic sheds. Types of work sheds include maintenance, equipment, hay, loafing, and shearing sheds as well as Quonset huts.

Farms, dairy farms, and ranches would all have equipment and maintenance sheds (*Figure 5-43*). These are used to house, protect, and repair the property's smaller agricultural equipment. This equipment would exclude the larger equipment found in a barn and would include machinery such as smaller gang plows, cultivators, tractor-pulled wagons, and hay loaders. Equipment and maintenance sheds would also include tools and supplies needed for repairs to machinery and buildings on the property. They most often exhibit a massed form, timber frame, wood or metal siding, and a gabled roof. Some equipment or maintenance sheds may also have additional rooms or open stalls on any given elevation.

Farms may also have Quonset huts (*Figure 5-44*). These structures are rectangular storage sheds with a semi-circular roof. They can be used to store anything on a farm from small equipment to hay or grain. Typically the huts have a steel frame with corrugated metal siding and became widespread in the United States and in Texas after World War II.

Dairy farms and ranches may also have hay and loafing sheds, as well as animal shelters. Hay sheds are used to store hay and straw for livestock feed and bedding (*Figure 5-45*). Most hay sheds are only

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partially enclosed with open bays and sometimes sliding doors. Gable, shed, and flat roofs are common. Early hay sheds were timber frame with wood siding. Steel and aluminum-sided sheds appeared in the 1930s and 1940s (Granger and Kelly 2005: 6.255-6.259). In the mid-twentieth century, the advent of electric powered hay dryers ushered in the ability to completely enclose the shed (Pennsylvania Historical and Museum Commission). Hay sheds are located in the agricultural work zone and the fields and pastures. In the agricultural work zones, the hay shed is usually set back slightly from the other buildings due to the dry nature of the hay and the potential for fire spreading to other buildings.

Loafing sheds are partially enclosed, three-sided buildings that provide shelter to livestock (*Figure 5-46*). They are usually timber frame and clad in wood or metal siding. The size of the loafing shed depends on the number and type of livestock on the dairy farm.

ADDITIONAL PHOTOS



Figure 5-44. Ca. 1950 Quonset hut. Source: TxDOT Environmental Affairs Division.

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Figure 5-45. Ca. 1930 hay barn with open stalls.



Figure 5-46. Ca. 1940 loafing shed adjacent to a corral.

Grain Storage Structure

Another common building type within this zone includes structures that are used for grain storage purposes. These structures commonly include silos, corn cribs, and grain bins. Size, form, and materials vary greatly depending on the intended use of the structure, the size of the agricultural property, and the extent of the agricultural activities.

Silo



Figure 5-47. Ca. 1940 upright silage storage structure.

Silos are located in the agricultural work zone as well as the fields and pastures on farms, dairy farms, and ranches. Common characteristics of a silo are impervious walls, structural strength, a smooth inner surface, wind resistance, and convenience for filling the silo and/or the animals feeding from it. Two types of silos are common on agricultural properties in Texas: the upright and the trench, or pit. Upright silos are cylindrical in form and constructed of a variety of materials, including poured concrete, concrete staves, concrete blocks, tile, reinforced brick, metal, and wooden staves encircled by metal hoops (*Figure 5-47*). Upright silos tend to have a high rate of survival in the twenty-first century agricultural landscape in both the agricultural work zone and in fields because of their permanence of construction and adaptability to store a wide variety of feeds. Trench and pit silos are subsurface structures that are not always feasible where soil conditions render excavation difficult, but they might

be less expensive to construct (Scoates 1937: 42-45; Thomas et al. 1949: 226-233). On dairy farms, silos are most conveniently located near the feed alley of the dairy barn (Scoates 1937:42-43; Thomas et al. 1949:396).

CORN CRIB



Figure 5-48. Ca. 1870 corn crib.

Corn cribs are another grain storage structure located on farms, dairy farms, and ranches. They are specifically designed to dry and store ear corn. Depending on the size and needs of the agricultural property, corn cribs can vary greatly in size, form, and materials. Cylindrical and rectangular massing with conical or gabled roofs are the most common forms. They are often elevated off the ground to keep out vermin. Corn cribs in the nineteenth century and early twentieth century were predominantly wooden and constructed with logs, poles, or planks with spaces between the horizontal wood siding for ventilation (*Figure 5-48*). Some masonry or brick corn cribs were also constructed. A hatch door in the upper wall or roof and portable elevators and conveyors were used to fill the crib in the 1930s. The corn crib was emptied by a set of doors or gates at the bottom of the crib. By the 1940s, wire fencing (often called crib fencing) was often installed between the bracing (see *Figure 5-59* in Other Agricultural Work Zone Resources section). Perforated steel corn cribs with predrilled holes in the metal siding also became popular. Cribs of structural clay tile, concrete block, and cement staves were also common; however, even by the 1960s, wood-frame corn cribs with slatted sides were still the dominant type in the United States (Granger and Kelly 2005: 6.64-6.65). For effective drying and accessibility to the grain once dried, corn cribs are located on a well-drained site that provides adequate air circulation (most often oriented north and south for cross-ventilation). On farms, they are usually placed at the edge of

the agricultural work zone and field and pastures for ease in harvesting. On dairy farms and ranches, they are located closer to the livestock for easy feeding (Granger and Kelly 2005: 6.63-6.64).

GRAIN BINS



Figure 5-49. Ca. 1945 metal grain bins.

Grain bins may also be found on agricultural properties (*Figure 5-49*). Similar to a corn crib, a grain bin also stores field crops but instead of ear corn, it houses shelled corn, in addition to threshed soybeans and small grains. The construction of and materials used for a grain bin differ from a corn crib. The weight of shelled and husked grains is greater than ear corn and therefore a grain bin needs additional support and bracing that is not necessary for corn cribs. Almost all grain bins are elevated from the ground to protect the grain from vermin, and tight seals on seaming are necessary to prevent spoilage (Pennsylvania Historical & Museum Commission). Grain bins can be cylindrical or rectangular, although cylindrical shapes are generally stronger. Early grain bins were largely rectangular in massing and wooden in construction. To support the weight of the grain, they also used different combinations of additional wood bracing, internal cross-ties, double-layered wood siding, and cribbed walls (where wooden boards are stacked flat with the broad side down and then a spike is drilled through the ends). Like round corn cribs, round grain bins also use cement staves, concrete blocks, structural clay tiles, or metal, and to a lesser extent, wood and poured concrete (Granger and Kelly 2005: 6.233-6.236). By the 1910s, round metal grain bins were commonplace. During World War II, wooden grain bins briefly became popular again due to the shortage of metal. Grain bins are also most often situated on well-drained sites and are physically separated from the other grain storage structures to allow farmers easier access to fill trucks for transport to the market or for livestock.

Milk Room and Milk House



Figure 5-50. Ca. 1890 stone and concrete milk house. The room on the right with the open door most likely dates to ca. 1890, while the gabled room to the left is an addition that may date to ca. 1925. The cast concrete topping the ca. 1890 section appears to be a non-historic-age addition and may function as a cistern, given the close proximity of the windmill in the background.

Milk rooms and milk houses are found almost exclusively on dairy farms (*Figure 5-50*). They house the equipment used to cool, handle, and store milk and milk products as well as to wash, treat, and store associated milk containers and utensils. They can be physically connected or included within the dairy barn or they can be completely separate buildings. As noted in the discussion of the cistern resource type in the *Domestic Work Zone* section, a milk room may be attached to a cistern for use by the property owner, rather than for commercial use. In what is called a “group system,” dairy cows were historically fed and bedded in a “covered yard or shed.” When milked, the dairy cows are taken to a small concrete-floored milk room and placed in stalls sufficient to take care of a part of the herd. There, they are sometimes fed grain while being milked. The advantage of this system, which was historically preferred in the South, was that it resulted in cleaner milk and was cheaper to install than the large dairy barn more typically found in the north (Scoates 1937:17, 21). In a similar later system called “loose housing,” feeding and milking occurred in a single dairy barn. The milk room or milk house either shared a common roof with the cow barn or was entirely separate from the barn structure.

Regardless of the location of the milk room or milk house, older milk rooms and milk houses do not have an opening directly into the barn for sanitary reasons. (In some instances, more recently constructed barns may be connected to the milk room.) The milk room is typically a small rectangular or square

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room which most often has a floor of concrete or other impervious material graded to promote drainage, easily cleanable walls and ceilings, good lighting and ventilation, screening on openings, water supplied under pressure, and appropriate equipment (Scoates 1937: 21; Thomas et al. 1949: 256-258, 291-292). Like the milk room, the milk house is also a small rectangular or square building. It is usually constructed of stone or concrete block and is topped with a gabled, hipped, or pyramidal roof (Pennsylvania Historical and Museum Commission, "Milk House").

Corrals, Pens and Loading Chutes



Figure 5-51. Rectangular metal corrals.

Corrals and pens are used to manage livestock on a dairy farm or ranch (*Figures 5-51 and 5-52*). They can be stand-alone or connected to other corrals, pens or structures, and they vary in size based on the livestock. In general, corrals are larger than pens and tend to enclose larger animals such as horses and cattle while pens are smaller than corrals and tend to enclose smaller animals such as sheep and hogs or only a few large animals (Barrett 2007: 59, 61, and 63). They typically incorporate loading chutes to move animals one at a time for loading/unloading, shearing, tagging, castrating, vaccinating, and medicating (*Figure 5-53*). Metal, wood, and rock can be used to construct corrals, pens and chutes. One particular type of pen is a bull pen. It is not necessarily distinguishable from other pens but its function is very specific as a tool for management and breeding activities of herd bulls. It is either located in a corner of the barn and opens onto an exercise lot or it is located in a corner of the exercise lot itself. The bull pen is constructed in a sufficiently strong and substantial fashion to prevent injury to both the owner and animal (Scoates 1937: 21; Thomas et al. 1949: 88-91). Fencing is often constructed with metal and wood, with metal or wood gates, although rock fencing may also be located on agricultural properties in German communities (Knott 2004). A wood breeding stall or chute is often at one corner of the pen. The cow enters the stall via an exterior gate and the bull enters directly from the pen (Granger and Kelly 2005: 6.42). After the 1940s, few bull pens were necessary for breeding due to the widespread use of artificial insemination by 1950 (Odom 2013).

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ADDITIONAL PHOTOS



Figure 5-52. Wood and wire mesh sheep/goat pen.



Figure 5-53. Metal and wood livestock chute. Source: TxDOT Environmental Affairs Division.

Dipping Vat



Figure 5-54. Concrete dipping vat.

The dipping vat is an elongated rectangle dug into the ground below grade and typically is of concrete construction (*Figure 5-54*). Vats can be found in the agricultural work zone and fields and pastures of a ranch or dairy farm. The width and depth of the dipping vats varied, depending on whether they were used for cattle, goats, or sheep. Before the advent of livestock inoculations, the livestock would be driven from a corral into a narrow wooden chute and then into a dipping vat that held pesticide. The livestock would then exit to a concrete drip pad and enter into a separate corral. In 1894, the King Ranch in South Texas introduced and promoted the success of dipping vats to control ticks that spread Texas Fever to cattle. They also provided control of other pests that could infect and decimate a herd.

Stock Tank/Water Trough/Self-Feeder



Figure 5-55. Concrete stock tank adjacent to corrals.

Stock tanks draw water from natural drainage, or water is pumped from a nearby well or windmill. They are man-made and provide water to livestock on agricultural properties. Early stock tanks are earthen and sometimes lined with rock or stone. Later tanks are usually lined with concrete or another impervious material (*Figure 5-55*). Stock tanks may also resemble the man-made pond found in the domestic work zone but are used to provide water for livestock. Water troughs are usually metal or concrete structures that are near a windmill or pump (*Figure 5-56*). Providing sources of water, stock tanks and water troughs may also be associated with soil conservation efforts of the mid-twentieth century. Along with self-feeders, they can be found in the agricultural work zone and fields and pastures. Usually constructed of metal, the feeders have troughs on both sides that allow livestock access to the grain (*Figure 5-57*). The feeder automatically replenishes the grain in the trough when it is low. Self-feeders are available in a wide range of sizes depending on the needs and number of livestock.

ADDITIONAL PHOTOS



Figure 5-56. Concrete water trough.



Figure 5-57. Metal livestock feeder.

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Other Agricultural Work Zone Resources

There are other resources that may be found within the agricultural work zone; however, they are not as common as those outlined above. Some of these less common resources are outlined in *Table 5-3* and photographs of the resources are provided below.

Table 5-3. Other agricultural work zone resources.

Resource Type	Function
Scales	To weigh livestock. Typically located in the agricultural work zone, although it may also be found in the fields and pastures (<i>Figure 5-58</i>).
Wire mesh corn crib	To store ears of corn. See also Grain Storage Structures resource type discussion above for further information on corn cribs.
Granary	To store threshed grain. See also Grain Storage Structures resource type discussion above for further information on granaries.

OTHER AGRICULTURAL WORK ZONE RESOURCE PHOTOS



Figure 5-58. Agricultural scale or grain with gabled cover on the left, located inside corral.

FIELDS/PASTURES

The activity within the fields and pastures is focused on raising crops and/or livestock. Common types of resources found within the fields and pastures zone are:

- Contouring/Terracing
- Drainage ditch
- Dam
- Self-feeder
- Loafing shed
- Stock tank and water trough
- Corrals, pens, and livestock chute
- Windmill
- Dipping vat
- Fence
- Cattle guard
- Cemetery

Note that several of the common resource types found in the fields and pastures may be found in the agricultural work zone as well, such as loafing sheds, stock tanks, corrals and livestock chutes, windmills, and dipping vats. While they may have been previously discussed in the agricultural work zone section, they are listed here so they are recognized and understood as resources that may also be found in the fields and pastures. See *Table 5-4* for more information regarding these common resource types and on which agricultural properties they generally are located.

ORGANIZATION

Fields and pastures comprise the third zone on an agricultural property. This zone has few man-made features and is characterized more by the agricultural activity and the modifications to the landscape and vegetation. It can include flat land, rolling hills, streams, and creeks. Fields and pastures comprise the majority of an agricultural property's acreage. On farms, this zone would include cultivated fields, which at any one time could appear as tilled fields, plowed fields, or fallow (dormant) fields. On dairy farms and ranches, it would likely include improved and unimproved grazing land and pastures, although some areas may be set aside to grow internally consumed feed crops, such as sorghum. Improved pasture land includes purposefully cultivated grasses, such as bluestem, buffalo, or coastal bermuda grasses. Unimproved pastureland could be any land where native vegetation is allowed to grow, and can include open grassland, wooded land, or rocky terrain. Depending upon the topography and quality of the soils and native grasses, ranchers and dairy farmers often have to bring cut hay to unimproved pasture land through much of the year. It should be noted that the fields within a ranch or

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dairy farm could be cultivated to supply all or part of the grains fed to the herd or to supply silage and fresh grass.

Fields and pastures are often connected directly to the agricultural work zone by an internal circulation network of driveways. This allows the farmer to move machinery directly from the agricultural work zone, where it is typically housed, to the fields. Driveways leading from public roads directly to the fields are also commonly found. Farms tend to have fewer internal driveways through their fields, as unused land equates to reduced profitability. As a result, farms tend to have dirt driveways lining the outside of the cultivated fields. Circulation patterns within and between the fields and pastures differ on dairy farms and ranches. Internal driveways are commonly dirt and are simple two-track paths that connect the agricultural work zone to and between pastures (*Figure 5-59*). Several internal driveways crisscross pastures to provide the most direct access among important locations within the pastures, such as self-feeders, loafing sheds, water troughs, and corrals.



Figure 5-59. Two-track path leading from the agricultural work zone into the fields and pastures; note the cattle guard and fencing separating the two zones.

A review of aerial images of fields and pastures illustrates how man-made features can be situated on the landscape and how circulation networks are organized on farms, dairy farms, and ranches. Examples are shown below that illustrate how fields and pastures vary on the different agricultural property types.

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Figure 5-60. Aerial view of a farm on CR 367 in Falls County, 2012. Source: Bing Maps.

Figure 5-60 shows a portion of a property previously illustrated in Figure 5-1 located on CR 367 in Falls County in Westphalia; however, this perspective is looking south and shows the fields. This aerial photograph of the CR 367 property shows the farm fields and the features within the fields and pastures (outlined in yellow). Drainages are natural features on the landscape, and dredging these features can enhance their water-carrying capacity. Figure 5-60 shows a drainage that bisects the property and illustrates how the fields are contoured in relation to the drainage feature. A main entry driveway provides access from the public road to the domestic work zone (outlined in blue) and the agricultural work zone (outlined in red), and another driveway provides access to the south and east side of the fields. Specific features within the property are identified by number and described below.

1. Entrance driveway extends from public road.
2. Domestic work zone includes a house and a small garage behind the house.
3. Agricultural work zone includes a barn and a shed.
4. Fields have been contoured to slow the rate of runoff.
5. A driveway on the southeast side the property provides access to the south and east sides of the fields.
6. Drainage runs through the center of the fields.

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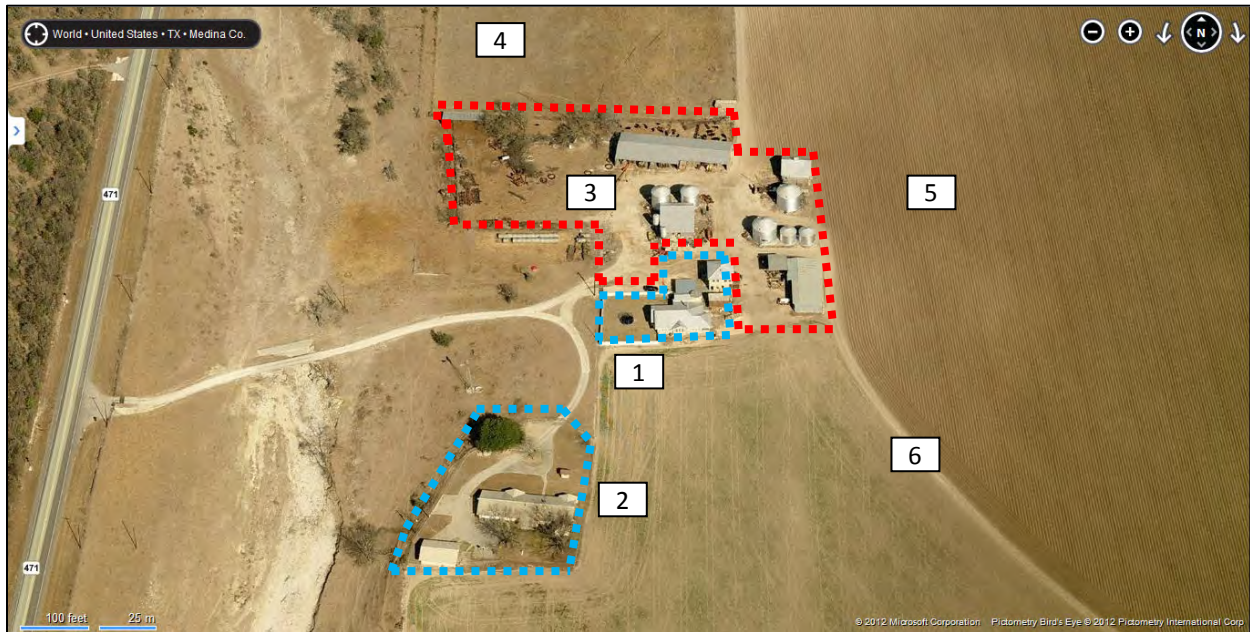


Figure 5-61. Aerial view of the Stolte Farm in Medina/Bexar counties, 2012. Source: Bing Maps.

Figure 5-61 depicts a portion of the Stolte Farm, which extends into Bexar and Medina counties. This agricultural property illustrates how multiple farming activities often are undertaken simultaneously on a single parcel of land and how the fields and pastures look different from each other. The aerial shows the two domestic work zones (outlined in blue) and the agricultural work zone (outlined in red). The domestic and agricultural work zones are surrounded by fields and pastures. The cultivated fields to the right (east) contrast with the pasture at the top (north) of the image. Livestock can be seen feeding within the cattle pen. Specific features within the farm are identified by number and described below.

1. Historic domestic work zone.
2. Secondary domestic work zone with 1960s house, garage and other ancillary buildings; note the fence to the east and south that separates this area from associated fields.
3. Agricultural work zone that includes historic and non-historic barns, sheds, silos, and other improvements.
4. Grazing pasture for cattle.
5. Tilled fields used for crop cultivation (irrigated with circular-pivot or circular sprinklers).
6. Unpaved road that is part of the internal circulation network.

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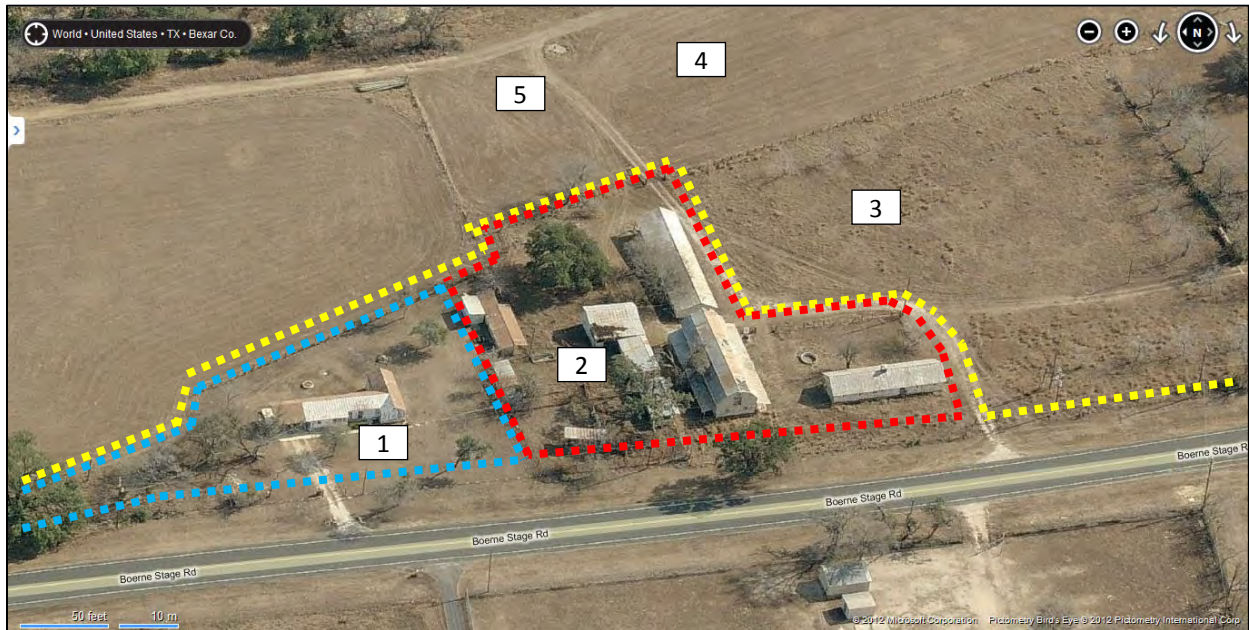


Figure 5-62. Aerial view of unidentified agricultural property along Boerne Stage Road, Bexar County, 2012. Source: Bing Maps.

Figure 5-62 shows what appears to be a dairy farm, as indicated by the large gambrel roof, transverse barn, in a rural area northwest of San Antonio. This property has unimproved and improved pasture land within the fields and pastures zone (outlined in yellow). The fields and pastures work zone is located directly adjacent to the agricultural work zone (outlined in red), and a two-track path leads from the agricultural work zone to the fields and pastures. Note that there is no direct connection between the domestic work zone (outlined in blue) and the fields and pastures. Specific features within the dairy farm are identified by number and described below.

1. The main house within the domestic work zone.
2. Agricultural work zone with a variety of structures, sheds, and tanks.
3. Unimproved pastureland.
4. Improved pastureland (lines in the field indicate freshly cut hay).
5. Unpaved two-track path that is part of the internal circulation network.

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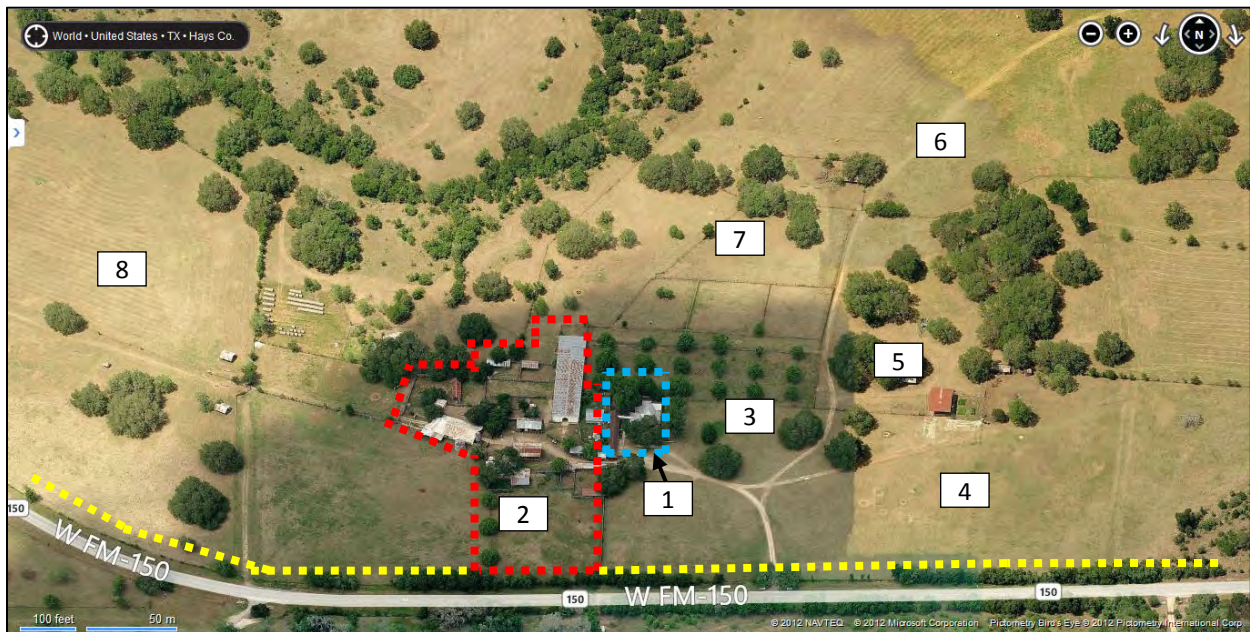


Figure 5-63. M. G. Michaelis Ranch, 3600 FM 150 West vicinity of Kyle, Hays County, 2012. Source: Bing Maps.

Figure 5-63 shows a remarkably intact ranch about seven miles west of Kyle. The ranch is listed in the National Register of Historic Places and encompasses approximately 2,880 acres. While the density of historic-age resources in the agricultural work zone is not typical of most ranches in Central Texas, this illustration shows that the fields and pastures zone is extensive and surrounds the domestic and agricultural work zones. The small domestic work zone (outlined in blue) is adjacent to the larger agricultural work zone (outlined in red) and surrounded by fields and pastures (outlined in yellow). Specific features within the ranch are identified by number and described below.

1. Domestic work zone.
2. Agricultural work zone.
3. Uniformly planted trees that are part of a small orchard maintained on the property.
4. Grassland used for grazing.
5. Barn in the fields and pastures zone likely used to store feed for livestock.
6. Unpaved roads that are part of the internal circulation network.
7. A grouping of corrals for livestock in the fields and pastures zone.
8. Improved pastureland (lines reflect freshly cut hay).

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COMMON RESOURCE TYPES

There are many common resource types found within the fields and pastures of farms, dairy farms, and ranches in Central Texas, which are outlined in *Table 5-4*. It is important to remember that a property may exhibit multiple agricultural activities, or its current agricultural activity may not be the same as its historic activity. Resources on agricultural properties are also often abandoned or reused and adapted for new functions. For example, it is possible that a farm may also have self-feeders or loading chutes that are typically found on ranches or dairy farms. The presence of these types of resources on a farm may indicate that the farm was historically used for other agricultural activities. For these reasons, it is important to understand the historic context of the survey area prior to completing fieldwork and to be aware that multiple agricultural activities could have occurred on a property over time.

Table 5-4. List of common resource types.

Common Resource Type	Farm	Dairy Farm	Ranch
Contouring/Terracing	X	X	X
Drainage ditch	X	X	X
Dam	X		X
Self-feeder*		X	X
Loafing shed*		X	X
Stock tank and water trough*		X	X
Corrals and livestock chute*		X	X
Windmill**		X	X
Dipping vat*		X	X
Fence		X	X
Cattle guard			X
Cemetery	X	X	X

*Previously discussed in the *Agricultural Work Zone* discussion above.

**Previously discussed in the *Domestic Work Zone* discussion above.

Contouring and Terracing



Figure 5-64. Aerial view of CR 404 in Guadalupe County showing various farms near Santa Clara that have contoured fields. Source: Bing Maps.

While contouring and terracing can be associated with all agricultural property types, they are most visible on farms (*Figure 5-64*). Introduced in the 1930s by the Soil Conservation Society (SCS) and other Depression-era federal agencies, these techniques are used to control soil erosion and conserve water. For more information on erosion, conservation, and other agricultural management, see Section 4, Historic Context. Contouring follows the topography of the terrain crosswise, rather than orienting crop cultivation up and down a slope (Pennsylvania Historical & Museum Commission). As a result, crops are in undulating rows rather than straight lines. Contouring occurs on the surface of the soil, whereas terracing results in cuts made in the soil that create multiple levels of receding platforms. Terraces can be broad or narrow depending on the slope, depth of soil, and cultivation needs of the farmer. In general, gentle slopes may exhibit broad terracing where most or all of the land can be farmed. Steep slopes or shallow soils with high bedrock would likely exhibit more narrow terracing where only part of the terrace or platform is under cultivation.

Drainage Ditch



Figure 5-65. Drainage ditch adjacent to cultivated fields; note how much lower the elevation of the drainage ditch is compared to the fields.

Drainage ditches may also be dispersed throughout the fields and pastures. Ditches transfer water away from crops or livestock (*Figure 5-65*). In Central Texas, ditches tend to be fairly narrow and small and do not typically connect into a larger drainage or irrigation system outside of the agricultural property; however, there are examples of irrigation systems in Bexar County and possibly in other locations in the study area. Early examples include hand-dug, earthen-lined open ditches. Later, tile pipes were introduced and the ditches were backfilled and covered with earth. With the introduction and availability of power machinery after World War II, ditches could be machine excavated and lined with metal, cement, or plastic pipes (Pennsylvania Historical and Museum Commission). They can also be seen cutting through fields or as water outlets associated with terracing.

Dam



Figure 5-66. Cut stone dam. Source: TxDOT Environmental Affairs Division.

Dams erected by local farmers or the SCS are commonly found throughout Central Texas (*Figure 5-66*). Dams in the area have been constructed by local farmers and ranchers since the nineteenth century, and were typically created for water retention and flood control. They were typically earthen dams or small cut stone dams that blocked small streams to create ponds or small lakes behind them. Dams that were a result of the SCS projects in the 1930s sometimes were larger engineered dams. These SCS dams were constructed for water retention and erosion control. As noted in Section 4, Historic Context, the construction of the dams (along with terracing) helped alleviate the impacts of drought and overgrazing.

Fence



Figure 5-67. Rock wall adjacent to fields and pastures zone.

Fences found in the fields and pastures zone are typically located on dairy farms and ranches, keeping livestock away from crops. Fences surrounding and between fields and pastures on dairy farms and ranches are commonly utilitarian and largely devoid of ornamentation unless they border a roadway or main driveway. Fencing allows the dairy farmer or rancher to separate livestock, which is especially important for pasture rotation and breeding. As a result, dairy farms' and ranches' pastures were often divided into several individual pastures to prevent overgrazing. The earliest fencing used in the Central Texas area was constructed of stone, particularly in German communities (*Figure 5-67*). Following its invention in the 1870s, barbed wire was widely used due to its durability and low cost. Attached to cedar or other types of wooden posts driven into the ground, barbed wire could be stretched across large distances (*Figure 5-68*). Stone and barbed wire fences are common on cattle, sheep, and goat ranches and dairy farms. Less expensive non-barbed wire fencing strung horizontally and vertically to create a wire mesh that was less destructive to the pelts of animals bred for wool or mohair was also commonly used on sheep and goat ranches. The introduction of mesh-wire fencing in the 1890s became an effective deterrent to predators. This type of fencing utilized woven wire with six-inch mesh stretched between cedar posts and stood 42 to 52 inches in height. These fences typically included barbed wire along the ground and up to three strands above the woven wire to impede wolves and other predators (Carlson 2012). Electric fencing was introduced in the 1888 at the XIT Ranch in the Texas Panhandle, but early efforts to use this type of fences were largely unsuccessful. The use of electric fences gained popularity during the interwar period and became more widespread in the 1950s and 1960s with

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advances in wiring and grounding techniques. The most common electric fencing seen in Central Texas consists of steel or high-tensile wiring strung between wood or metal posts (*Figure 5-69*). Insulators are mounted to the wood or metal posts. Wood fences were sometimes used for cattle ranches and dairy farms; however, wood fences were more expensive and more labor intensive to construct and maintain. Therefore, they are typically only found along roadways or the main driveways, and other, less expensive fencing (such as barbed wire) is found between fields or out of sight of the public.

ADDITIONAL PHOTOS



Figure 5-68. Barbed wire fencing between cedar and metal posts.



Figure 5-69. Detail of electric fence with electrified wiring in the middle between the barbed wire strands.
Source: www.patriotglobal.com.

Cattle Guard



Figure 5-70. Cattle guard at the entrance to a property.

Cattle guards are made of metal bars or pipes spaced approximately three to five inches apart over an open pit that allows automobiles to drive over them, but prevents hooved livestock from crossing them (see *Figures 5-31* and *5-70*). Developed in the early 1900s when automobile ownership increased, cattle guards reduced the need for numerous gates on a property and enabled ranchers and dairy farmers to drive their vehicles unimpeded at the property entrance and between separate fence-lined pastures. The history of cattle guards can be traced back over 2,000 years ago, but the design evolved in the early twentieth century to deal specifically with the use of gasoline-powered vehicles. Cattle guards became popular in the decades after World War I as automobiles, trucks, and tractors became more affordable. Typically, they were made from purchased materials and welded on site by ranch or farm hands. It should be noted that sheep and goats are not hindered by cattle guards and, as a result, they will not likely be found on sheep and goat ranches, except to keep cattle from entering a property.

Bump gates are often considered a type of cattle guard (*Figure 5-71*). A vehicle pushes the gate, causing the gate to swing open so the vehicle can pass through without the driver needing to exit the car to open and close the gate. The gate automatically closes behind the vehicle. Like cattle guards, bump gates may be found at the entrance to the property as well as along fence lines separating pastures and the agricultural work zone.

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ADDITIONAL PHOTO



Figure 5-71. Bump gate at entrance to property. Source: www.panoramio.com.

Cemetery



Figure 5-72. Cemetery located in the fields and pastures of an agricultural property.

A cemetery may also be located in the fields and pastures, away from the main house (*Figure 5-72*). Most often this resource is a family cemetery associated with the owners of the property. A cemetery may exhibit a wide variety of headstones, including but not limited to upright headstones, ledger markers that are flush with the ground, family plot monuments, and slab markers that cover the entire grave (Indiana Department of Natural Resources – Division of Historic Preservation & Archeology). Typically the cemetery is enclosed with a stone, wood, metal, or wrought iron fence. The cemetery may also include tree cover and other vegetation.

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Other Fields and Pastures Resources

There are other resources that may be found within the fields and pastures; however, they are not as common as those outlined above. Some of these less common resources are outlined in *Table 5-5* and photographs of some of the resources are provided below.

Table 5-5. Other fields and pastures resources.

Resource Type	Function
Center pivot irrigation system	To water crops. The center pivot irrigation system moves on wheels in a circular pattern (<i>Figure 5-73</i>). Most irrigation systems and canals found in Central Texas are located within one or a few properties rather than connecting an entire region such as those located in the Texas Rio Grande Valley and in West Texas.
Lateral move irrigation system	To water crops. It is virtually identical to a center pivot irrigation system but it moves in a straight line rather than a circular pattern. As is the case with center pivot irrigation systems, lateral move irrigation systems would be part of a smaller irrigation system located within one or a few properties.

OTHER FIELDS AND PASTURES RESOURCE PHOTO



Figure 5-73. Center pivot irrigation system in field. Source: www.usgs.com

SECTION 6. EVALUATION METHODS

SECTION 6. EVALUATION GUIDELINES

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INTRODUCTION

Providing NRHP-eligibility recommendations is the final step in the survey and evaluation process and relies on the successful completion of all previous tasks outlined in these guidelines. NRHP evaluation is particularly critical because it complies with major legislative acts dealing with cultural resources (NHPA and NEPA) and their implementing regulations. Designed primarily for use on a reconnaissance-level survey, the steps outlined in this chapter direct the historian along a path and logical progression of thought that builds upon the results of historical research and field investigations. These steps assume the historian has experience with and a good understanding of the NHPA and the National Register Criteria for Evaluation. Definitions, key terms and concepts associated with these standards are identified elsewhere in the report and are not repeated in this section.

NRHP eligibility requires a property to meet at least one of the National Register Criteria, AND to retain sufficient integrity to convey its significance. The following steps identify a recommended process to assess the significance and integrity of agricultural properties and their eligibility for inclusion in the NRHP. The evaluation process assumes that the properties subject to assessment were used primarily for agricultural purposes during their periods of significance.

- Step 1: Review and critically assess information gathered during research and field investigations.
- Step 2. Assess significance under the National Register Criteria for Evaluation¹ and Criteria Considerations; begin to identify periods of significance based on the research and field investigations.
 - Step 2a. Assess significance under Criterion A.
 - Step 2b. Assess significance under Criterion B.
 - Step 2c. Assess significance under Criterion C.
 - Step 2d. Assess significance under Criteria Considerations.
- Step 3. Define the Period of Significance.
- Step 4. Analyze the Aspects of Integrity.
- Step 5. Analyze the characteristics of a Historic Rural Landscape.

¹ Under directions from TxDOT, this study does not consider the research potential of agricultural properties and, therefore, does not provide instructions for applying National Register Criterion D. This criterion typically is used to assess archeological sites, but such resources are excluded in this study.

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Step 6. Identify integrity thresholds for NRHP Eligibility.

Step 7. Determine and justify property boundaries.

Step 8. Classify resources as Contributing or Noncontributing Elements.

Each of these steps is explored in greater detail in subsequent paragraphs. Each step includes key topics and action items to ensure consistency in thought and analysis. Following this discussion, each step includes a list of questions to further guide the historian in the NRHP-evaluation process.

STEP 1. REVIEW AND CRITICALLY ASSESS INFORMATION GATHERED DURING RESEARCH AND FIELD INVESTIGATIONS

This effort will enable the historian to understand what types of agricultural resources were recorded, what historical associations are linked to these properties, and what changes occurred over time. This step should take place **BEFORE** beginning National Register evaluations. The historian should:

- ***Possess a good sense of the general time period when most of the surveyed resources were constructed.***

Combine research that provides background data about events and historical patterns with an analysis of information from field survey to understand developmental periods.

- ***Know what cultural or ethnic groups originally and subsequently settled in the study area.***
The historian typically gains this knowledge and insight through historical research from both primary and secondary source materials such as those identified in Section 2, Research Guide. Field observations also can contribute to the historian's understanding. For example, noting the religious denominations present in the study area and the names of individuals in cemeteries may be indicative of particular settlement patterns and groups. In addition, distinctive architectural forms or land-use practices can reflect traditions of certain groups. Names on mailboxes and ranch gates, as well as road names, may be another important source of this kind of information that surveyors can obtain while undertaking field investigations.

- ***Know what types of agricultural activities have taken place in the study area initially and how they may have changed over time.***

Comparative information about agricultural activities is available in almanacs, agricultural schedules of decennial censuses, and historic aerials and maps. For information about using mapping sources for agricultural property investigations, see in Section 2, Research Guide. Physical elements in the landscape are another data source that can reveal much about land-use patterns and agricultural activities. For example, loading chutes adjacent to public roads or railroads indicate that ranching has been an important agricultural activity in a particular area. Abandoned tractors, plows, and other farm equipment in an uncultivated

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field with grasslands and pastures would suggest that the land formerly was used to grow crops. See Section 5, Property Types for information about common property types found on various agricultural properties.

- ***Develop an understanding of the kinds of resources represented in the landscape, their original uses and functions, and how they may have changed over time.***

Field investigations provide the basis for knowing what types of historic resources exist within the study area and how their uses reflect agricultural trends. At a macro level, agricultural practices within the study area were established by the mid-to-late nineteenth century and have been maintained since then. Land east of IH 35 and the Balcones Escarpment historically has been used to cultivate cotton and other crops, while areas to the west contain mostly ranching operations. However, this delineation is overly simplistic as variations can and do exist, and they can reveal much about the individual property owner and historical trends and agricultural practices. In addition, dairying occurred in all parts of the study area.

It is the layering of different agricultural practices through time that is often the most important aspect of an agricultural property. For example, observations made during the course of the development of these guidelines noted many abandoned single-family dwellings in the Blackland Prairies belt, which was the state's largest producer of cotton from the 1890s through the 1930s. Most of these modestly scaled dwellings likely were the homes of tenant farmers who primarily grew cotton. Over-farming, soil depletion, changing market conditions, and shifting demographic patterns contributed to the abandonment of many of these structures by the mid-twentieth century. Rather than demolish these buildings, many land owners converted them to places to store hay or feed for cattle and other livestock that now graze on what was used as farmland earlier.

- ***Understand the kinds and dates of alterations to buildings and changes in agricultural activities.***

Physical alterations can reveal periods of relative wealth and prosperity among the individuals and families who engaged in agriculture within the study area over time. Most farmers and ranchers were resourceful people who adapted to ever-changing conditions and often altered and modified their properties and buildings as needed. Field investigations should document alterations and physical changes to the resources, noting additions and the introduction of non-original or non-historic materials, finishes, and detailing. Such alterations may be indicative of important trends in local history or may merely reflect the unique circumstances of an individual or family. Conversely, a lack of alterations may also indicate economic stagnation that produced few profits for local agriculturists. With a lack of financial resources, they often could not afford to make changes.

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- ***Know what historical factors, patterns, events, and themes were important to the study area.***

The historic context should concentrate on the time period when most of the recorded resources were built and used and when the land was used for agricultural-related activities. Moreover, the context should identify those agricultural patterns that are important in local, state, or national history. This information helps the historian understand the historical forces that shaped the built and cultural landscape and also provides the basis for determining significance of an agricultural property relative to these patterns, themes, and events.

- ***Understand non-historic (i.e., after the survey cut-off date) activities and associated physical changes that may alter the historic character of the landscape.***

The introduction of new operations and activities in the recent past (i.e., after the survey cut-off date) can detract from the ability of an agricultural property or rural landscape to retain its historic character and qualities. The degree to which these changes affect historic character and integrity depends on the type, frequency, severity, and scale of these activities. Rapid growth and development within the study area and along the primary transportation corridors within it (IH 35) have contributed to suburban sprawl. Increased residential and commercial developments and associated infrastructure (roads, utility lines, etc.) may intrude upon the historic agricultural character of the study area. The construction of large power transmission lines can disrupt the visual continuity that once existed across a field or pasture.

Questions to Guide Analysis of Information Obtained During Research and Field Investigations

The following questions provide some additional guidance as the historian considers the information gathered during research and field investigations. These questions are intended to assist the historian to organize and synthesize the data and to facilitate the process of evaluating significance and integrity in subsequent steps.

- Did the Research Design accurately predict what kinds of resources were recorded in the field? If not, what was found and what were the historical themes, trends, or events that contributed to the development of and are reflected in these resources?
- Were the questions posed in the Research Design answered, and did they provide sufficient insights for the historian to understand the historical associations linked with and the architectural influences exhibited by the surveyed resources?
- Does the historic context provide the framework for understanding the events, patterns and themes that are directly associated with the recorded agricultural properties?

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- What are the broad agricultural and land-use patterns observed during field investigations, and are they consistent with what the Research Design implied or suggested?
- What historical factors may have affected the kinds of buildings that are present, the use or functions of these resources, or the way agricultural land-use patterns shifted and changed over time?
- How prevalent are new buildings and structures within the APE and study area? What impact have they had on the historic landscape?
- How prevalent are vacant buildings? Have unoccupied/unused buildings been converted to new uses, or are they abandoned and in varying states of deterioration or disrepair? Does their current appearance still convey information about their previous functions?
- Did these changes to properties and within landscapes occur prior to the survey cut-off date?
- What do research and field investigations suggest may be the basis for defining the period of significance in the study area?

STEP 2. ASSESS SIGNIFICANCE UNDER THE NATIONAL REGISTER CRITERIA FOR EVALUATION AND CRITERIA CONSIDERATIONS

After completing a review and analysis of field and research data, the historian will use NPS guidelines to assess the NRHP-eligibility of agricultural properties in the APE. The historian must base these assessments on NPS-defined National Register Criteria for Evaluation. For those properties that usually are not considered for such designation such as cemeteries, NPS allows for Criteria Considerations that are explained in NPS Bulletin 15. The process of evaluating significance within these criteria are described in greater detail in the following steps.

STEP 2A. ASSESS SIGNIFICANCE UNDER CRITERION A

The historian should rely on the historic context to evaluate the property for NRHP eligibility due to its association with broad trends or important historical events under Criterion A. Many agricultural properties are likely to possess significance under Criterion A because they are directly associated with important trends or patterns in crop cultivation, raising of livestock, or producing milk and other dairy products (*Figure 6-1*). While recognizing that association with important historical themes or events is just the first step in evaluating NRHP eligibility under Criterion A, this section will guide the historian to consider what elements are important for an agricultural property to derive significance for these associations.

- ***Understand what makes the historical theme, pattern, or event described in the historic context significant within the framework of National Register Criterion A.***
The historic context that accompanies these guidelines identifies farming, dairying, and ranching as being among the principal agricultural activities in the 13-county Central Texas

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region. The context also provides a framework that will help the historian understand some of the trends that influenced and affected agricultural operations in the region. Finally, the historic context establishes the framework that helps the historian make decisions about the significance of agricultural properties.

- ***Understand the inter-relationships between agricultural land and the buildings on it; consider how the land reflects significant historical agricultural practices and land-uses.***

A fundamental element of any agricultural property is the inter-relationship that exists between the built environment and associated lands. Because the land and built environment function together as a distinct and identifiable agricultural landscape, the entire property should be viewed in a holistic manner. Understanding the co-dependent nature of this relationship is a key part of evaluating historic agricultural properties and assessing their relative significance under Criterion A. For example, a house, barn, and other associated outbuildings typically found on agricultural properties provide shelter for the people and equipment, and storage facilities that supported successful farming, ranching or dairying operations and activities. In turn, profits generated from the sale of commodities produced on the associated lands enabled owners to construct and maintain their residences and support buildings. The absence of any of these elements on an agricultural property diminishes the property's relative significance in the area of agricultural and associated historical themes.

- ***Consider how the property possesses significance when evaluated from the perspective of the historic context.***

The process of evaluating significance requires that a property be evaluated from the perspective of the associated historic context. This assessment forces the historian to consider a multitude of factors that might make an agricultural property stand out within the study area. Moreover, it compels the historian to realize that mere association with an agricultural trend is not sufficient justification for historic significance. A farm, ranch, or dairying operation must embody the characteristics and qualities that collectively reflect an important historical pattern, theme, or event within the APE or study area. If such a step is not undertaken, any property could be significant for any reason just because it simply exists and reflects the historical factors behind its establishment or construction.

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- ***Identify the areas in which the agricultural property may derive significance for its association with an important historical event, trend, or pattern and determine if that significance is at the local, state or national level.***

Based on the broad historic context that accompanies these guidelines, the principal areas of significance that an agricultural property may possess significance are identified below.² Again, association alone with an important historical event, trend, or pattern does not mean a property is significant. The historian must consider the reasons why an agricultural property is significant using any of the established areas defined by NPS. The following are those areas of significance most likely to be applicable for agricultural properties; however, other areas may also apply, as relevant. It is anticipated that most agricultural properties will be significant at the local level; however, some properties may possess state or national significance.

AGRICULTURE: Most agricultural properties are likely to derive significance in the area of agriculture. The cultivation of crops, raising of livestock, and making of dairy products are the unifying activities that distinguish the kinds of properties that are the subject of these guidelines. To be significant within the area of agriculture, however, the property should retain the physical characteristics associated with a farm, ranch, or dairying operation. For example, the property may be noteworthy as a family-run farm from the second quarter of the twentieth century in a particular locale because it embodies all of the traits and aspects typically associated with such an agricultural complex. The land may still be used to grow crops and the grouping of resources in both the domestic and agricultural work zones may retain their character-defining features and spatial relationships (see *Figures 6-1* and *6-2*). The property also may be the first of its kind or may have been used to demonstrate new techniques for farming or improved livestock. Regardless of the kind of historical association (pattern, trend or event), significance must be linked directly to the historic context and to property's contributions to agricultural activities within a specified geographic area.

ETHNIC HERITAGE: A diversity of people originally settled and engaged in a broad range of agricultural activities in the 13-county study area. Among the most notable were the German-speaking immigrants who settled primarily in the Hill Country and established farms and ranches throughout the region. However, other European groups (e.g., Swedes, Czechs, Wends) moved to Central Texas and likewise became farmers and ranchers. They, too, made contributions to agriculture as did African-Americans and Mexican-Americans. Vestiges of the diverse backgrounds of pioneers and early settlers remain visible on the agricultural

² A property may be associated with other historic contexts and thus may be significant in other areas of significance than those associated with agriculture.

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landscape and survive as tangible links to an identifiable ethnic or cultural group. An agricultural property may derive significance in the area of ethnic heritage for such reasons. For example, many German farmers in the Hill Country erected stone fences as they cleared and prepared land for farming. Others used stone fences to control livestock and made use of the inexpensive and readily available building material. These fences and other physical remnants may be representative of a particular group or culture and may be among the few examples of their kind in a specified geographic area.

EXPLORATION/SETTLEMENT: Some of the agricultural properties in the study area can be traced to the original settlement and establishment of agricultural operations in a particular locale. In such cases, the existence of a farm or ranch may be a direct and tangible link to permanent settlement patterns if, however, the property retains the salient physical characteristics from the period of significance. In many cases, these properties will date to the mid-nineteenth century; some of them also may be associated with a particular ethnic group. To be significant in this area, the property must still retain the qualities that reflect this historical association, and the associations and physical characteristics must be clearly defined and explained.

GOVERNMENT: Policies and programs of local, state, and federal governments have had an enduring effect on agricultural activities in the 13-county study area of this project. Manifestation of these actions is seen at multiple levels on the agricultural landscape and has affected the way land is used at a macro or micro level, what types of crops are grown, and what types of livestock are raised.

Questions to Guide Criterion A Assessments

To assist with the process of determining significance under Criterion A, the following questions provide greater direction and focus for the historian who is evaluating how an agricultural property may derive significance for its historical associations with an important event, trend or pattern of the past. These questions are by no means a definitive list of topics to consider; however, they highlight some of the most common aspects associated with the significance of agricultural properties under Criterion A. In addition, the degree to which these questions can be answered may be limited by the budget and scope of the survey, i.e., reconnaissance- or intensive-level investigations.

- What period does the property represent, and was this era important in local agricultural history?
- Are agricultural and land-use patterns significant at a local, state, or national level?
- Is the property an example of a historic farm, ranch, or dairy farm that serves to illustrate agricultural activities over time? Is it noteworthy and, if so, why?

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- Does the property derive significance because of its association with innovative agricultural practices, techniques or procedures?
- Does the property derive significance because the type(s) of crops cultivated on the land marked a departure from previous agricultural practices and introduced a new product to the area or region?
- Does the agricultural property possess significance when evaluated from the perspective of the historic context? Does that significance stem from the collection of buildings and land-use patterns that reflect important agricultural patterns from the past?
- Does the property derive significance because it was used to develop or improve distinctive breeds of livestock, etc.?
- Is the property a good local example of agricultural practices associated with an ethnic or cultural group, and does it retain the qualities that demonstrate the distinctive agricultural practices of that group?
- Does the property derive significance because it is an early or noteworthy example of the effects of a government-sponsored program that changed or influenced agricultural patterns?

TOOLS TO ASSIST CRITERION A ASSESSMENTS

- GIS Guide
 - Historic Maps
 - Historic and Current Aerials
- Research Guide
 - Publications
 - Historic Maps and Other Cartographic Data

STEP 2B. ASSESS SIGNIFICANCE UNDER CRITERION B

This step considers significance derived from links with a noteworthy individual of the past. Rarely is this type of information readily known or easy to obtain for a reconnaissance-level survey because determining past ownership typically requires more in-depth research than is usually necessary or appropriate for an intensive-level historic resources survey. For that level of effort, the historian must examine deed records, tax rolls, plat maps, and other legal instruments to identify past owners of a property. The historian must then conduct additional research of primary and secondary source materials to see what, if any, contributions past owners may have made to local, state, or national history. Nevertheless, general research for the preparation of a reconnaissance-level survey may identify a significant individual who owned a historic agricultural property within the APE. The following will guide the historian with the process of assessing significance of an agricultural property under Criterion B.

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- ***Identify the important individual and the reasons why that person is important in local, state, or national history.***

Secondary source materials, such as published county histories or state historical markers, typically are the sources that the historian will use to identify associations with important persons of the past. This information can be obtained while preparing the Research Design, reviewing information available at the THC, or gathering materials to prepare the historic context. Interviews with local informants, such as property owners or members of county historical commissions, also may identify an important person who is associated with an agricultural property. Ideally, the historian should confirm that association through some type of historical research, but time and budgetary constraints may inhibit such an effort if the survey is undertaken at a reconnaissance level. Individuals who are noteworthy in state or national history are better known and documented (*Figure 6-3*). In contrast, those whose contributions are at the local level will be more difficult and time consuming to identify, and usually can only be identified during an intensive-level survey.

- ***Confirm that the individual derives significance for activities related to agriculture.***

Since the properties that are the subject of these guidelines are being evaluated as agricultural properties, associated individuals must have made an important contribution to this specific theme in history. Examples of known associations with the Central Texas area include George Kendall, a Comal County rancher who played an important role in the development of sheep ranching in Texas (state level); H. R. Wurzbach in Bexar and Medina counties, who was an early advocate of dipping vats as a means to control the spread of cattle tick fever (local level); and Alexander Duff Mebane, an innovative plant and animal breeder (state level) who lived in the vicinity of Lockhart (*Figure 6-4*). If the association is not directly related to agriculture, the individual may still be significant in history; however, the association is tied to another historic theme that is separate from and independent of this study. As such, that association must be justified in sufficient detail to argue that the property has significance under Criterion B.

- ***Identify the areas in which the agricultural property may derive significance for its association with an important historical figure and determine if that significance is at the local, state or national level.***

Agriculture is the only area of significance most likely to be used for a property that meets Criterion B within this context, although an important individual may be significant under other areas as well. An agricultural property that is noteworthy for its association with an important individual of the past typically will be significant at the local level; however, some properties are associated with an individual who has state or national importance.

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AGRICULTURE: The person who is important in this area of significance will have contributed to agricultural activities through innovation or leadership. The property must have been associated with the individual during the time when he/she achieved significance. For example, the individual may have been influential because he/she introduced a new strain of a particular crop, improved livestock breeds, or developed farming or ranching techniques that improved yields and productions.

Questions to Guide Criterion B Assessments

The following questions are designed to help the historian evaluate the significance of an agricultural property that may be associated with an important historical figure under Criterion B. These questions highlight some of the most common topics to consider while undertaking such assessments, but research may lead to additional questions. The feasibility of answering these questions is limited by the budget and scope of the survey, and may be answered only through intensive-level investigations.

- What are the contributions of the individual and how did they encourage, improve, or support agricultural activities?
- Why is the individual significant in history; are there other properties that are a better illustration of that individual's significance?
- Did the person invent important agricultural machinery?
- Did the person develop new strains of specific crops?
- Was the person a leader in agricultural organizations?
- Did the individual attain significance for contributions made to the cultivation, harvesting, or production of crops?
- Did the person embrace new technologies or practices that improved the quality of livestock or increase the profitability, marketing, or distribution of livestock and related by-products?
- Did the individual contribute to efforts to expand dairying operations and its profitability through innovative means?
- What is the association of the property with an important agriculturist?

TOOLS TO ASSIST CRITERION B ASSESSMENTS

- GIS Guide
 - Historic Maps
- Research Guide
 - Publications

STEP 2C. ASSESS SIGNIFICANCE UNDER CRITERION C

This analysis requires the historian to possess a strong knowledge of architectural (and engineering) trends in local, state, and national history that is firmly rooted in familiarity with high-styled and

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academic architectural movements and expressions, as well as experience with vernacular, folk, and popular building traditions (*Figure 6-5*). Understanding and recognizing the architectural elements and features used to categorize a surveyed resource as an example of a particular type or method of construction is essential. This information provides the foundation for justifying significance based on the building's physical attributes or quality of design. Moreover, alterations, additions, and other physical changes must be considered to assess how these changes diminish or compromise the salient elements that distinguish a resource as a noteworthy example of a style, form, or method of construction. While Criterion C allows a resource to be significant as the work of a master builder or architect, the likelihood of such significance among agricultural properties within the 13-county study is remote, but not out of the question. As with other NR Criteria, assessment under Criterion C requires comparative analysis as the basis for determining significance and must make use of data from the survey of resources within the APE and the greater study area. Whereas Criterion A and, to a lesser extent, Criterion B consider all aspects of an agricultural property that groups the built environment and associated lands as part of a cultural landscape, resources that may have significance under Criterion C can be limited to one building or a grouping of buildings in domestic or agricultural work zones. The following section will guide the historian with the process of assessing significance of an agricultural property or any of its associated buildings or structures under Criterion C. For information about common agricultural property types found in Central Texas, see Section 5, Property Types.

- ***Classify a building or structure within any of the defined associated property types categories and compare with similar resources in the study.***

The Property Types discussion classifies buildings, structures, and objects into meaningful categories that are based on use and physical characteristics (*Figure 6-6*). Each recorded historic-age resource should be compared with similarly categorized buildings to determine how the resource retains the distinctive qualities that make it distinguishable as an example of its type or category and if it shares the same characteristics seen in comparable buildings.

- ***Determine if the resource is a good example of a style, type, or method of construction.***

A building, structure, or object may be significant under Criterion C if it retains the salient features of its property type category and it remains an intact and noteworthy example of its type. The more common the type, the more difficult it is to argue significance. For example, most of the country experienced unprecedented growth and prosperity during the postwar era that triggered a major housing boom. This surge in construction extended not only to urban centers in the study area but also to rural areas throughout the 13-county region. The abundance of domestic forms from the mid-twentieth century makes it more difficult to argue significance because they are so common and are less likely to be extensively modified. Conversely, older house forms may have been subjected to more changes and modifications; however, they are far less prevalent and thus may be more significant because they are not as common and because of their age.

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- ***Determine if the resource exhibits physical attributes that are associated with a distinctive ethnic group.***

The cultural and ethnic backgrounds of the various groups who moved to the study area and pursued agriculture as a livelihood introduced a diversity of distinctive building forms and traditions that reflected their heritage. This trend was particularly true during the mid-to-late nineteenth century.³ Many of these pioneers constructed residences, barns, and other agriculture-related outbuildings based on the vernacular and folk traditions with which they were familiar. Some of these distinctive forms were common to the Upland and Lowland South, while others reflected European-based traditions. The *fachwerk* houses in Comal and surrounding counties illustrate such a trend.

ARCHITECTURE: An agricultural property that is significant in this area illustrates important vernacular, folk, or popular building traditions. It may be a dog trot house or a transverse crib barn that reflects the Upland South heritage of its builders. The resource may also be an intact example of a Craftsman bungalow, which was a domestic architectural form that enjoyed widespread popularity during the interwar period. Regardless of the form, style, or method of construction, the building should retain most of the salient features that make it recognizable as a good example of its type.

ETHNIC HERITAGE: Buildings and structures on agricultural properties reveal much about the background and heritage of their occupants/users.

Questions to Guide Criterion C Assessments

The following questions provide guidance while assessing significance stemming from the physical attributes or design quality of a building, structure, or object on an agricultural property.

- Is the building significant because it displays noteworthy craftsmanship in its construction or embellishment?
- Does the building exemplify methods of construction that are common or unusual within the APE and study area?
- Is it a unique or rare example of a building type or form? Is it common in the surrounding region, and does it reflect vernacular or folk traditions of an ethnic group or culture?
- Does a building represent an intact example of its kind from a particular time in history? What makes it significant for that reason?

³ It should be noted that the study area does include Bexar County where significant settlement did occur during the Spanish and Mexican Colonial eras. However, most parts of the study area were settled during the early statehood years.

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- Is it noteworthy because it embodies the assimilation of a distinctive group into the dominant culture or society in surrounding areas?

STEP 2D. ASSESS SIGNIFICANCE UNDER CRITERIA CONSIDERATIONS

The National Register Criteria for Evaluation allow certain kinds of properties that usually are not considered for listing in the NRHP to be eligible for such designation, provided they meet additional conditions known as Criteria Considerations. The kinds of resources subject to these provisions include properties owned by religious organizations, moved properties, cemeteries, commemorative properties, reconstructed farms, ceremonial sites, grounds associated with birthplaces or graves, and places that are less than 50 years of age. Any of a number of scenarios are possible that will enable these kinds of properties to be significant under these Criteria Considerations; the following are selected examples that include agricultural properties.

- A religious institution may own a farm or ranch that is significant because of the agricultural operations that took place on the property; the property may consist of an important grouping of farm, ranch, or dairy buildings.
- A relocated building, such as a house, barn, or shed, can be significant and contribute to the property's overall historic quality and character if it was moved to its present site within the period of significance (see Step 8: Classify Resources as Contributing or Noncontributing Elements).
- A farm house or burial plot that marks the birthplace or grave of an important person of the past can be significant if there is no other more appropriate place directly associated with that individual's life. Such a resource is a contributing element on the property.
- A family cemetery on a farm or ranch burial plot may be significant because it includes the grave of an important personage, or because of its antiquity (age), distinctive design features, or association with historic events. Typically such a resource is a contributing element on an agricultural property.
- A reconstructed building can be significant if it is in a historically appropriate setting, is part of a restoration master plan, and no other building or structure with the same associations has survived. All three of these conditions must be met for such a resource to be significant on an individual basis or to be a contributing feature in a district. Such a scenario is unlikely to be encountered during the evaluation of agricultural properties based on these guidelines.
- A commemorative marker can be significant for its design, age, tradition, or symbolic value. However, resources in this category typically are on public right-of-way and are not on privately owned land. In the unlikely event that such a marker is on private property, it may be significant if it is a rare example of historic highway marker or Texas Centennial marker.
- A resource that achieved significance within the last 50 years and possesses exceptional importance may be significant. While likely a rare occurrence, an agricultural property may

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derive significance from an agricultural practice of transcendence importance within the recent past that affected agricultural activities in the study area, state, or nation.

STEP 3. DEFINE PERIOD OF SIGNIFICANCE

The next step of the NRHP-eligibility assessment process is defining the period of significance. This step is confined to those agricultural properties that possess significance under at least one of the National Register Criteria. NPS defines the period of significance as the time span when a property was associated with important events, activities, persons, cultural groups, or land uses, or when it attained noteworthy physical qualities or characteristics. The period of significance can vary greatly; it can be as short as a single year or extend over a multi-year period, depending on the reasons the property achieved significance. An agricultural property may have more than one period of significance that represents separate and distinct chapters reflecting continued operations and activities over time.

Delineating the period of significance is an important step in the NRHP-eligibility evaluation process because many decisions, outcomes, and consequences affecting the management and the assessment of potential impacts to historic properties rely on these time limits. For example, the period of significance provides the basis for determining if changes to a building or land use enhance or detract from the property's overall historic character and ability to convey its significance. The period also facilitates the classification of identified resources as either contributing or noncontributing elements. This categorization directly supports assessments of adverse effects and Section 4(f) implications. Therefore, the process of delineating the period of significance should be the result of a deliberative thought process that can be justified. To that end, the historian must consider the physical characteristics of the property and its components and the historical associations that are the foundation of significance under applicable National Register Criteria.

For an agricultural property, the period of significance typically begins with the year when the oldest building, structure or some other kind of physical evidence directly linked to agricultural activities was put into use.⁴ This date does not necessarily represent the date of the main building (usually the main house) since other resources such as barns, cistern, fences, and other outbuildings may be older and reflect earlier agricultural-based activities (*Figure 6-7*). The period of significance could also mark the start of a shift in land-use patterns that are a result of shifting marketing conditions, government programs, or expansion of the road network that was used to get goods to market.

⁴ The study area includes many areas where Spanish and Mexican colonialists established agricultural operations along the San Antonio and other rivers in Bexar and nearby counties. These colonialists raised livestock and grew crops but rarely do any physical remains associated with these early agricultural activities survive on the landscape.

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The period of significance typically concludes when the historically important events, activities, associations or construction have ended. For agricultural properties, this is often based on external factors that influenced agricultural operations and activities on the property. For example, the drought of the 1950s had a profound effect on agriculture in the study area and led to major shifts in land use. Shifting demographic patterns, the effect of government subsidies, and the rise of agri-businesses are among other important trends that marked a noteworthy break with previous agricultural operations. If the property is significant under Criterion C for its physical characteristics, the end of the period may be the date when construction activities ended.

For properties that have changed and achieved importance during a span of many years, multiple periods of significance should be identified. The historian must also be aware that all landscape characteristics should be considered. Extant buildings and structures in the domestic and agricultural work zones may date to one era, while land use, circulation networks and other landscape features may date to later periods.

The continued use of the land for agricultural purposes may not be sufficient justification for continuing the period of significance. The years defining the period of significance should reflect the span of time when the property attained significance and be directly associated with important trends, activities, and events described in the historic context (*Figure 6-8*). The recommended 50-year age threshold can be used to mark the conclusion of the period of significance if a more specific date cannot be identified; however, it should be used sparingly because it is a somewhat arbitrary benchmark.

STEP 4. ANALYZE THE ASPECTS OF INTEGRITY

An agricultural property that meets at least one of the National Register Criteria must retain sufficient integrity to convey its significance to be eligible for inclusion in the NRHP. NPS defines Location, Design, Setting, Materials, Workmanship, Feeling, and Association as the Seven Aspects of Integrity. Like other kinds of cultural resources being evaluated for NRHP eligibility, agricultural properties do not need to retain all of the aspects of integrity. Rather, they should retain those aspects that are the foundation of significance to a sufficient degree to support an argument for eligibility. For instance, an agricultural property that derives significance under Criterion A as an intact and well-preserved example of a dairying operation from the second quarter of the twentieth century must retain those aspects of integrity to convey significance for its historical associations. Aspects of integrity that rely on more physical-based characteristics, such as integrity of workmanship or materials are not as important as integrity of association, feeling, and setting. To aid the assessment of integrity, the following identifies each of the seven aspects and applies them to agricultural properties.

Integrity of Location

Location refers to the place where a historic property was constructed or a historic event occurred. By definition, an agricultural property not only includes groupings of buildings used for domestic, work, and

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storage purposes, it also encompasses associated lands that historically have supported agricultural activities. Within an agricultural property or landscape, it is very common to move and reuse individual buildings. In fact, some agricultural buildings were designed to be easily moved. In other cases, buildings are moved in response to a change in agricultural activity. For this reason, farm buildings and farmsteads may represent challenges to what is a straightforward rule in other settings. Therefore, if the movement of an agricultural building occurred as a result of changing agricultural patterns during the period of significance, then there has been no loss of integrity. However, if a farm building was moved or reused after the period of significance, then integrity of location does not exist.

Steps that the historian should take while assessing integrity of location are:

- Determine if the buildings have been relocated from their original site.
- Determine the year or approximate date when any buildings, structures, or objects were moved.
- Compare the date of movement to the period of significance assigned to the property.

Relocation within the period of significance likely will not detract from the property's overall historic character. Conversely, movement of a building after the close of the period of significance diminishes qualities that may make an agricultural property significant.

- What were the reasons for the move?
- How does the existing site of the resource compare with that of the original or historic location?
- Did the relocation contribute to the agricultural success of the property?
- Was the building moved within the period of significance of the property?

Integrity of Design

Integrity of Design as it pertains to agricultural properties may be assessed on the level of individual buildings within a farm, ranch, or dairy; on the level of the entire collection of buildings that comprises each agricultural property; on a landscape level in which the totality of buildings and landscape elements are considered; and on the level of an agricultural district, in which the integrity of multiple linked agricultural properties is considered.

On the level of individual buildings, design “is the combination of elements that create the form, plan, space, structure, and style of a property” (U.S. Department of the Interior 1991:45). Design extends to elements such as the placement of windows and doors, arrangement of interior spaces, and types of structural systems and materials used in construction. For barns and other outbuildings, interior integrity assumes the presence of plan elements that are characteristic of specific barn types (*Figure 6-9*). Interior alterations to barns, outbuildings, and even residences may occur without compromising integrity of design. However, it is important that changes reflect the impacts of significant agricultural changes in a region. If such changes postdate the period of significance and change or destroy historic fabric, then integrity of design may not be present.

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On the level of a collection of buildings that comprises an agricultural property, where it is common to have a mixture of contributing and noncontributing buildings and structures, integrity may hinge on the extent to which noncontributing buildings are present, their scale, and their locations. For example, a single farm, ranch, or dairy may have multiple examples of barns, silos, or other buildings, a few of which do not date to the period of significance. However, their presence may not compromise the integrity of design of the collection as a whole because their scale and siting do not overwhelm the contributing buildings but rather suggest the continuity of significant agricultural patterns for the region and the period of significance. In other cases, buildings and building groups that might be considered contributing may have a loss of integrity of design if they are in proximity to modern buildings and site features that overwhelm their scale or historic fabric (*Figure 6-10*). In yet other cases, more modern buildings and structures may be concentrated at a sufficient distance to ensure the integrity of other clusters of buildings that date to the period of significance.

On a landscape level, integrity of design is maintained when the form, plan, and spatial organization of the agricultural property is maintained from the period when the property achieved significance. Assessment of integrity on a landscape level requires an understanding of the overall farmstead layout. For example, the placement of buildings relative to public roads or natural features is a deliberate decision that is an element of design. Likewise, the use of land based on topographic or natural features is part of the design process. Evaluation of landscape-level integrity of design therefore requires an assessment of the extent to which the agricultural property has traces of fences of various types, water features, circulation patterns, fields, gardens, orchards, and ornamental planting, where appropriate. It is not necessary for all elements in their entirety to be present because the on-going operation of an agricultural property requires changes to some historic landscape features. But vestiges should be apparent. If all or most of the elements from the period of significance have been removed by more modern agricultural practices such as large-scale mono-cropping, then it is likely that integrity of design will have been lost as well.

On the level of a historic agricultural district, it is important that the farms, ranches, or dairy farms that comprise it have an acceptable level of integrity collectively.⁵ It also is important that transportation elements connecting the individual agricultural properties within the district remain, as well as historic field patterns and other elements that were present during the period of significance. The historian

⁵ According to the National Register Bulletin *Guidelines for Evaluating and Documenting Rural Historic Landscapes*, rural historic landscapes are listed in the NRHP as either sites or districts. Landscapes small in size that have no buildings or structures are classified as sites. On the other hand, an agricultural property that encompasses multiple acres and contains buildings, sites, and structures (such as a ranch or farming community) may be classified as a historic district. Groupings of agricultural properties within a well-defined area that are distinct from their surroundings, present a sense of cohesiveness, and possess significance and sufficient integrity, also may comprise a district. It is important to realize that a historic landscape is considered a way to understand a property; whereas a district is an NPS-defined designation for NRHP eligibility and listing.

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must balance the extent to which there is both architectural integrity and landscape integrity within a historic district, since each is equally important to integrity of design. The following are among the many items the historian should consider while assessing integrity of design for agricultural buildings and structures, collections of buildings and structures, agricultural landscapes, and historic agricultural districts. This list is by no means definitive and is offered as guidance. Other items not included may also be applicable and appropriate depending on the circumstances and conditions at the property. Elements to consider include:

- Reconfigured roof lines, forms, and profiles.
- Enclosure of porches, doors, or windows.
- Changes to fenestration patterns and size of openings.
- Removal of decorative features and embellishment.
- Construction of additions onto existing buildings and structures.
- Construction of non-historic buildings within in domestic or work zones.
- Changes to areas enclosed for livestock (pens, stables) that alter land-use patterns.
- Reconfigured circulation networks (roads, driveways, etc.) within the property.
- Construction of structures, objects and other features on the landscape that fall outside of the period of significance.

A critical step in the process of assessing integrity of design is determining when the changes occurred. If completed within the period of significance, alterations to fundamental elements of design may have attained significance for their contributions to the ongoing agricultural operations and activities on the property or resource.

- Are alterations more severe on the main building? How does that affect integrity of design to the property as a whole?
- If alterations are more pronounced and extensive to associated outbuildings, what is the combined effect on these changes to the property as a whole?
- Has the construction of non-historic buildings altered the spatial relationships among the historic buildings; how have they affected agricultural activities?
- Has the functional organization of the property changed?

Integrity of Setting

Setting is the physical environment and character of the place surrounding a historic property. Setting considers such attributes as the placement of buildings, as well as the location of landscape features, vegetation, and natural and topographical elements. Among the Seven Aspects of Integrity, setting is one of the most important for an agricultural property because significance so often is derived from the relationships that exist between clusters of buildings and the surrounding landscape. For example, a historic farm that only includes the main house and associated outbuildings may no longer retain

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integrity of setting because it lacks the contextual environment that appropriately expresses its role and contribution to agricultural patterns in a specific area. The loss of land used to cultivate crops that were integral to the farm's successful operation effectively robs the property of its historical contextual setting. This effect is more pronounced if the former farmland has been subject to redevelopment and the historic farmhouse exists in a contextual void, divorced of its historic surroundings (*Figure 6-11*). Similarly, a change in the use of land from farming to grazing, for example, may result in a loss of integrity of setting if the change occurred after the period of significance and resulted in a loss of the preponderance of features linking the land to farming activities.

A key factor that the historian must consider while assessing integrity of setting stems from knowing what types of agricultural activities took place over time, as well as when and where they occurred. As the context makes clear, the environmental conditions in Central Texas contributed to a dynamic quality in agricultural patterns in the region. Agriculturalists often undertook multiple agricultural practices simultaneously so that an agricultural property does not necessarily fit neatly into a single category of farming, ranching, or dairying. They all may have existed on one property at the same time. Integrity of setting is maintained if the natural and cultural environments retain the qualities that existed when the property achieved significance.

While assessing integrity of setting, the historian should note:

- Placement of existing buildings, clusters, driveways, and fencing and use historic maps and aerial photographs to document changes over time.
- Non-agricultural use and development on adjoining properties that may diminish the overall integrity of setting; examples include new residential developments or commercial construction.
- Fences and roads built after the period of significance that may have affected or changed agricultural activities and circulation networks.
- Shifts in the public road alignments and any subsequent effects on the focus and orientation of the property.
- Changes in the alignment of public roads and highways that may have triggered the need for a new entrance driveway.
- Non-agricultural features on the landscape, such as easements for underground pipelines, etc.
- Changes in natural vegetation over time.
- Changes in major water features abutting the property, such as rivers that may have been dammed to create reservoirs.
- The construction of a residential suburban neighborhood or a commercial development adjacent to the property.

Information obtained from the field investigations and thorough analysis of research materials is vital to assessing this critical aspect of integrity. This information will enable the historian to document changes over time and to consider if these changes occurred within the period of significance and thus

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contribute to or detract from the property's overall historic character. The following questions give the historian further guidance for assessing integrity of setting and are particularly important for agricultural properties that derive their significance under Criterion A for their associations with important historical trends, events, or patterns.

- Does the overall landscape of the agricultural property retain the qualities that make it significant for its historical associations?
- Do the landscaping and plantings within the domestic work zone represent important elements that distinguish this cluster from other parts of the property?
- Have historic circulation patterns remained sufficiently intact over time to remain recognizable on the landscape?
- Did landscape changes contribute to agricultural operations on the property and are they important to its significance?
- What are the effects of underground pipelines, power transmission lines, and communication towers to an agricultural property?
- How has encroachment from development on adjoining properties affected the ability of the property to present its sense of the past?
- Has the land been manipulated with contouring, etc., to improve farming or control erosion? Did that work occur during the period of significance?

Integrity of Materials

For an agricultural property, integrity of materials refers to the physical elements that were combined in a particular configuration at a particular time to form a historic property. Materials are the exterior finishes and physical elements used to construct, sheath, define, or decorate houses, barns, and other structures used for shelter and storage. Integrity of materials also includes such resources as fences, driveways, gates, windmills, stock tanks and other man-made elements on the landscape that support agricultural activities and operations.⁶ Recycling and reuse of materials is ubiquitous at agricultural properties (*Figure 6-12*). Therefore, integrity of materials is maintained if the resource retains the fabric used in its original construction or if the fabric was used, installed, or applied within the period of significance and does not diminish the historic character and quality of the resource.

The historian should note the following when assessing integrity of material:

- Exterior finishes on roofs, walls, windows, doors, and other architectural features.
- Application of non-historic finishes on historic-age resources.

⁶ NPS guidelines in Bulletin 50 note that vegetation also can be an example of materials but acknowledges it to be a "complex problem." For the purposes of this report, the inclusion of vegetation is not explored.

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- Removal of original or historic materials on the exterior.
- Introduction of materials on additions or alterations.

Most of the information used to assess integrity of materials comes from field investigations, which record the kinds of materials on the surveyed resources. The historian must have a good understanding of the salient and character-defining features of each of the defined property types and should be able to discern if the materials are of historic age. Knowing when certain kinds of materials were used and when they gained popularity provides the basis of estimating dates of construction and recognizing the introduction of non-original materials. Such an analysis will enable the historian to determine if the materials were used or applied within the period of significance and if the resources contribute to or detract from the property's overall historic character. The following questions give the historian further guidance for assessing integrity of materials and are particularly important for agricultural properties that derive their significance under Criterion C because of their physical attributes or quality of design.

- Is the alteration a response to changing conditions and trends related to agriculture?
- Does the introduction of materials that do not date to the period of significance detract from the historic character of the property to such an extent that it no longer contributes to the significance of the property?

Integrity of Workmanship

Workmanship is the physical evidence of traditional or historic craftsmanship. It illustrates the skills and talents of a craftsman and may reflect a distinctive building tradition, popular architectural style or form, or innovative work techniques. Because of the links to physical characteristics and qualities, integrity of workmanship is particularly critical for a resource on an agricultural property that derives significance under Criterion C. Workmanship typically is evidenced by the type of architectural detailing and ornamentation on a building; it also may reflect noteworthy construction methods or techniques. In addition, workmanship may refer to skills closely related to agricultural practices for which there is physical evidence such as fence building, contour plowing, windbreak planting, garden construction, construction of other infrastructure such as tanks or cattle and sheep dips, or farm planning. A stone fence, for example, may display highly skilled craftsmanship that represents a fundamental aspect of its significance (*Figure 6-13*).

A historic resource that possesses integrity of workmanship typically also retains sufficient integrity of materials and design to illustrate the craftsman's defining skills and talents (*Figure 6-14*). Recycling and reuse of materials is common on agricultural properties, and evidence of such changes still may contribute to the resource's historic character as long as they are part of a pattern or historic trend and occurred within the period of significance. In other cases, changes can affect integrity of workmanship. These may include missing architectural features and embellishments and differences in the quality of construction, detailing, and ornamentation.

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Integrity of workmanship relies on the existence of the historic materials and design elements that provide the means by which the craftsman showcases skills and techniques. The following questions provide additional guidance for the historian while assessing integrity of workmanship. This aspect of integrity is especially vital for resources on agricultural properties that are noteworthy for their physical characteristics and possess significance under Criterion C. The following questions will aid with this assessment.

- Do the buildings and structures display noteworthy detailing in their construction, finish, or embellishment?
- Is the craftsmanship indicative of a particular ethnic group and does it retain the physical traits that make that association evident?
- Have distinctive physical features been covered, replaced, or removed?
- Are these changes and alterations easily reversible and how do they diminish from the property's historic character?

Integrity of Feeling

Integrity of feeling refers to the aesthetic and historic qualities of a property and considers the combined effect of changes to the salient and character-defining features of a resource or property. An agricultural property that retains its integrity of feeling is easily recognizable to the period when it achieved significance. An agricultural property lacking integrity of feeling typically lacks integrity of design, materials, setting, and workmanship due to the multitude of changes and alterations that have taken place over time (*Figures 6-15 and 6-16*). These modifications include the buildings and structures but also could extend to the surrounding landscape. Depending on their scale and when they occurred, changes that can affect integrity of feeling can include:

- Physical changes to the resources (alterations, additions, enclosures, etc.).
- Abandoned and vacant buildings in varying states of deterioration.
- Demolition or relocation of historic-age resources.
- Construction of buildings and structures after the close of the period of significance.
- Introduction of new elements on the landscape such as transmission lines, communication towers, and pipeline easements.
- Changes in land use of surrounding fields.
- Change in spatial relationship to other resources or construction of new resources surrounding the agricultural complex.
- Alteration or loss of important boundary demarcations.

Integrity of feeling relies on the ability of a property to evoke a strong sense of the past based on its physical characteristic and visual qualities. Assessment of whether or not a property retains integrity of feeling is based primarily on the results of the field survey and an understanding of the associated

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property types and their respective character-defining features. The following questions provide further direction for the historian assessing integrity of feeling.

- Does the main building within an agricultural complex fall within the established period of significance? If so, does it still convey its integrity of design, materials, and workmanship?
- What is the combined effect of alterations, post-dating the period of significance, to the main building and associated outbuildings?
- How have changes to the land and land use altered the historic character of the property and would a person from the period of significance still recognize the property from his or her association with the property?
- How has the introduction of new buildings and structures affected the historic qualities of the domestic and agricultural work zones and the associated landscape?
- Is the remaining acreage of land large enough to convey major agricultural functions?
- Is the complex still in use or has it been abandoned?
- How has the setting of the surrounding area changed? Have these changes affected the spatial relationship of the agricultural complex to other resources?
- Is there still a distinct delineation between domestic and agricultural spaces? How has the relocation of buildings affected this delineation?
- Are there cultural techniques still reflected in the property?

Integrity of Association

Integrity of association links a property to the important historical events, activities, patterns, or individuals that are the foundation of its significance. An agricultural property retains its integrity of association if it continues to convey its agricultural use through the presence of buildings, structures, and historic landscape features associated with agricultural functions. A property that serves an entirely different function is often modified to such an extent that integrity of association may be diminished or compromised (*Figure 6-17*). In other words, if the property's historic function is no longer discernible then the property no longer possesses integrity of association. It is important to note that changes due to new crops or other agricultural practices associated with ranching and dairying do not necessarily diminish a property's integrity of association.

Some factors to consider while assessing integrity of association include:

- Continued agricultural activity on the property, especially if significance is derived under Criterion A in the area of agriculture.
- Land-use patterns that date to the period of significance.
- Remaining land acreage large enough to convey major agricultural functions.

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The following questions provide further direction for the historian assessing integrity of association.

- Is the property still functioning as an agricultural property?
- If the property is no longer used for agricultural activities, but historic-age resources and fields are still intact, does the property retain a sense of its original or historic function?
- Do ongoing agricultural operations date to the period of significance? How have they changed over time?
- How do changes in land use and agriculture-related patterns and activities contribute to or detract from the property's overall historic character?
- How has the associated acreage changed over time, and how does this affect the land-use patterns and ability of the property to convey its agricultural use?
- Do the extant historic-age resources reflect the agricultural use of the property during its period of significance?

STEP 5. ANALYZE THE CHARACTERISTICS OF A RURAL HISTORIC LANDSCAPE

Agricultural complexes, such as ranches and farms, typically share cohesive characteristics as a grouping, making them more easily understood as such, rather than as individual buildings, structures, and objects. In National Register Bulletin 30, NPS defines 11 characteristics of these groupings, known as rural historic landscapes, which play a key role in the process of evaluating agricultural properties for NRHP eligibility. Considering these characteristics requires the historian to evaluate all aspects of an agricultural property, not just the buildings and structures that typically represent the focal point of a complex and historic resources survey. Relationships between buildings to one another, as well as to the associated land should be examined, allowing the entirety of the property and its characteristics to be considered in NRHP eligibility assessments. Each of the 11 characteristics is subject to further discussion in the following paragraphs. See Section 7, Case Studies for examples of how to analyze and apply the characteristics of a rural historic landscape to agricultural properties within Central Texas.

Land Use and Activities

The types of activities and land uses of an agricultural property are fundamental to understanding how it functioned over time and are critical in the process of assessing the significance of an agricultural property. The ways in which the land has been and is currently used and the kinds of actions that have occurred on the associated land provide a direct link to the historic context and the period of significance (*Figure 6-18*). Changes to these characteristics due to natural, cultural, economic, or other factors may sever the historical link or association that may be significant within historical patterns, events, or persons of the past.

Patterns of Spatial Organization

The organization of buildings, structures, and agricultural land provides a key insight into the operations of agricultural properties. The spatial patterns between main house, ancillary buildings, as well as their

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relation to livestock and crops highlight how both domestic and work functions take place on a property and support its agricultural-related operation. Organization is reflected in circulation networks, field patterns, proximity of buildings to water sources, as well as the location and orientation of buildings and structures. Everyday functions of an agricultural property, such as storage of goods, maintenance and storage of machinery and tools, feeding and protection of livestock, and the daily activities of the family can be identified through the patterns of spatial organization of buildings, circulation networks, and land. In assessing the integrity of a property's spatial organization, one must determine if the historic organization has been disrupted. Possible causes of disruption might include the introduction of new buildings, roads, or boundaries (*Figure 6-19*). These new elements might alter the historic work zones that reflect the ability of the property to convey significance from its historic years of operation.

Response to the Natural Environment

The location of agricultural properties historically depended upon a number of factors including the availability of natural resources, such as water for irrigation or mechanical power, or stone and wood for the construction of buildings. In addition to the availability of these natural resources, factors such as soil deposits greatly influenced the agricultural activities suited to a specific geographic region. An example in the study area would be the distinct areas east and west of the Balcones Escarpment. Typically, soils west of the Escarpment are rockier than those found to the east. Ranching activities, therefore, became more prevalent in the western portion of the study area, as the soil and landscape generally were less conducive for crop cultivation than the more fertile soils within the Blackland Prairie belt, which was better suited to farming and could be used for a broader range of agricultural activities. It is important to note that farming did occur west of the Escarpment but was far more limited because of the prevailing soil conditions. Property owners also altered the landscape in reaction to the natural environment, for example, by terracing the land to combat erosion, building windmills to provide sources of water for livestock, and constructing stock tanks for water and soil conservation (*Figure 6-20*). Evidence of erosion control, buildings constructed of local materials, and the usage of the land all provide links to the historic response of the property owner to the natural environment.

Cultural Traditions

The construction methods, materials, and even styles of buildings provide historians with clues to discern cultural traditions on agricultural properties. For example, many German immigrants who came to Texas during the mid-nineteenth century and settled in the New Braunfels area used *fachwerk* construction to build their residences (*Figure 6-21*). This construction method featured a half-timbering framing system with brick, stone, or other materials as infill, which was a European vernacular building form. Whereas a *fachwerk* building in Central Texas likely would indicate a builder of German descent, a dogtrot house typically reflects a completely different building tradition. This distinctive domestic form was brought to Texas from settlers who hailed from the Lowland South. The Property Types section identifies other distinctive vernacular and folk traditions. Besides the form and method of construction, cultural traditions may also be evident by the types of buildings and structure constructed on the

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landscape. Smokehouses, washhouses, spring houses, and cellars are just a few examples of such trends (*Figure 6-22*). In addition to buildings, structures on the property, such as German stone fences, can reflect cultural traditions and heritage of early settlers. The presence of structures and buildings that display culturally influenced construction methods, forms, materials, or styles, gives historians a more complete understanding of the history of the agricultural property and why it was built and shaped a particular way. During the twentieth century, many of the vernacular and folk traditions that had previously prevailed throughout Central Texas were discarded as agriculturists constructed new building forms and adopted new land-use practices popularized in mass-circulated publications and other media. This trend resulted in a more homogeneous character on the cultural landscape in rural areas of Central Texas, but vestiges of cultural traditions still remain throughout the region.

Circulation Networks

External circulation networks, such as railroad lines and minor and major roadways influenced the location of agricultural properties and land use. The location of nearby external circulation networks would allow farmers and ranchers to ship their goods to larger markets, which allowed them to farm and ranch at a larger scale than more isolated agricultural properties. Circulation networks internal to an agricultural property used to transport people, goods, and materials include dirt roads and paths, driveways, and foot paths (*Figure 6-23*). The location and network of these routes directly relate to land use. Because a path or road would not ordinarily run through a field on a farm but rather around its perimeter, the location of historic routes might provide clues as to boundary demarcations for fields and the property, as well as the location of storage buildings. The introduction of larger machines and equipment, as well as a change in land use or the introduction of new buildings and structures, are factors that might have altered the location of historic circulation networks. On a ranch or dairy farm, circulation networks may follow a more direct path developed by the livestock who grazed on pastures. Regardless of their origin, purpose, and function, circulation networks are an important feature on the cultural landscape of an agricultural property and can add to an overall sense of cohesiveness and reveal much about land use patterns and practices.

Boundary Demarcations

On a large scale, boundary demarcations delineate property lines; however, they can also delineate areas of special use within the property that were used to separate herds for breeding purposes, or fields used to grow different crops. Although wood posts with barbed-wire fencing are the most common types of materials used for boundary demarcations, metal poles, electrical fences, and stone fences are other kinds of materials used for such purposes (*Figure 6-24*). Many agricultural properties make use of natural features to delineate boundaries and can include drainages, a grove of trees or shrubs, or depressions and uplifts in the land (*Figure 6-25*). Boundary demarcations are a subtle aspect of the landscape, but are also key characteristics of agricultural properties that help define the distinct zones within an agricultural property, as well as of the property within the larger context of the region. Boundary demarcations are especially important when considering road widening projects that may

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alter historic delineations or take land from the property, which could impact land use. Changes in land use, the addition of new buildings, and acquisition or conveyance of acreage can all impact historic boundary demarcations.

Vegetation Related to Land Use

Vegetation includes crops, trees, shrubs, or grass that were intentionally planted by the property owner for agricultural or domestic purposes, as well native grasses, trees, and other plants that have grown along boundary demarcations, in pastures, abandoned fields, and along fence lines (*Figure 6-26*). The various types of vegetation are directly related to land-use patterns and the type of agricultural operation historically associated with a property. Whether crops grown in the fields, grass planted in the domestic zone, or wildflowers and grasses present between a field and a roadway, the type of vegetation is an indication as to the function of the land on which it is growing. This feature is the most likely of the 11 characteristics of historic rural landscapes to change over time, as factors such as drought, agricultural prices, technology, as well as changing consumer tastes and demands influenced what crops are grown or landscaping is planted.

Buildings, Structures, and Objects

This component includes a wide variety of resources associated with serving human, animal, and crop storage needs related to the operation of agricultural properties (*Figure 6-27*). The materials, construction methods, design, workmanship, date of construction, and location of buildings, structures, and objects provide a link to the historic activities, cultural traditions, and skills of the people who built, used, and occupied them. The kinds of resources also can reveal much about land-use patterns over time. The seven aspects of integrity—association, design, feeling, location, materials, setting, and workmanship—as defined by the NPS, need to be considered when assessing the integrity of historic buildings, structures, and objects.

Clusters

For the purposes of this report, clusters on agricultural properties include two distinct groupings that reveal their primary role within the operation of an agricultural property: domestic work zone and agricultural work zone (see *Figure 6-28*). This characteristic also relies on other features of rural historic landscapes. For example, each cluster is comprised of buildings, structures, objects, within a defined area that fulfill a specific role in day-to-day functions. These clusters also rely on circulation networks that can be used to transport people, livestock, goods, materials, and equipment between these clusters. The location of the clusters relative to boundary demarcations and to external road networks can also reveal much about land use and activities and cultural traditions associated with a particular property. Negative impacts to historic clusters might include new buildings, removal or alteration of historic buildings, and changes in land use.

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Archeological Sites

For the purposes of this study, archeological sites are not part of the evaluation process; however, if they are known to exist, they should be taken into account, especially if a transportation project has the potential to impact an archeological site.

Small-scale Elements

Small-scale elements such as ranch gates, ranch signs, abandoned machinery, and cattle guards add to the historic setting of an agricultural property and might be a part of larger components (circulation networks, boundary demarcations, etc.) on the property (*Figure 6-29*). These elements help provide a comprehensive historical link to the period of significance. Due to the small nature of these objects, in time many of them have likely been moved, removed, or suffered from deterioration.

These eleven characteristics examine the qualities that the historian should use to identify and evaluate agricultural properties recorded during a historic resources survey. It is important to note that these characteristics extend far beyond documenting the historic built environment and represent the key components within the domestic and agricultural work zones of an agricultural property. Instead, they reinforce the idea that these elements are part of a grander and more inclusive landscape and force the historian to approach agricultural properties in a more holistic fashion. While the guidelines do consider the physical attributes of the main house and outbuildings, they also consider the spatial relationships that exist among the buildings, roads, fences, and associated fields and pastures. They also consider the land that supported agricultural activities. These characteristics require the historian to examine and evaluate the entire landscape and all of its components as a single and distinct entity.

STEP 6. IDENTIFY INTEGRITY THRESHOLDS FOR NRHP ELIGIBILITY

An agricultural property that is significant under National Register Criterion A, B, or C must meet an integrity threshold for it to be eligible for inclusion in the NRHP. The property must be recognizable to its period of significance, convey a strong sense of time and place, and retain a sufficient amount of the qualities that demonstrate the reason(s) it is significant under any of the National Register Criteria. Ideally, an NRHP-eligible agricultural property should consist of a main house and support buildings within a domestic work zone, ancillary buildings and structures (barns, sheds, etc.) within an agricultural work zone, and associated lands that support the significant agriculture-related activities.

To reinforce the idea that an agricultural property is more than just a main house and a nearby grouping of ancillary buildings and structures, the historian should use the National Register classification of a district as the best and most effective way to understand and evaluate agricultural properties for NRHP eligibility. Such an approach forces the historian to consider the associated land that supports agricultural activities and treats the various components of the property as a unified whole.

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As defined earlier in the report, a farm, ranch, or dairy operation typically has three distinct elements or areas: a domestic work zone, an agricultural work zone, and associated lands. Each component represents an essential part of any agricultural property and directly supports the activities that are the basis for significance under this context. Each area contains its own set of resources that must be assessed for integrity. This analysis follows a general model presented in *Tilling the Earth: Georgia's Historic Agricultural Heritage - A Context*⁷ and requires that at least two of the three elements on any agricultural property retain integrity to be eligible for listing in the NRHP under this context. This threshold provides a degree of flexibility that acknowledges the inherent dynamic quality of agriculture in Central Texas. Ideally, all three components of an agricultural property from the period of significance (domestic work zone, agricultural work zone, and associated lands) should survive and remain associated with the property. The degree to which each of these components retains integrity and still be eligible for the NRHP can vary widely and depends on the reasons the property is significant. A property significant under Criterion A, for example, would likely need to retain a higher degree of integrity for the associated landscape than a complex of buildings significant under Criterion C.

Eligibility under Criterion A

Since an agricultural property eligible under Criterion A derives significance from historical associations, those aspects of integrity that have a more intangible quality play a greater part in NRHP-eligibility assessments than those that are based on physical characteristics and traits. In addition, the associated agricultural landscape often assumes a more important role in significance under Criterion A. While the types of agricultural activities may have changed over time, the land should still retain the general character that existed during the period of significance. For example, the cultivation of a new crop that was not grown during the period of significance generally does not compromise the integrity of the land as long as the fields remain clearly recognizable as an agricultural landscape. On the other hand, the conversion of historically tilled fields to grazing pastures to raise livestock represents a more dramatic departure from the past, especially if significance stems from the harvesting of crops. The change in land use may compromise the ability of the landscape to contribute to the property's historic character, particularly if the change occurred outside the period of significance.

The agricultural work zone should contain buildings and structures that are fundamental to the operations of the property and survive as a tangible link to the past. The buildings need not be in their original or historic state but should nonetheless retain a degree of the salient physical features. A similar situation applies to the domestic work zone. Ideally, the main house from the period of significance should be extant; however, it is not a requisite if the collection of ancillary buildings in both the domestic and agricultural work zones retain a high degree of integrity.

⁷ This publication, published in 2001, was prepared by New South Associates, Inc. for the Georgia Department of Natural Resources, Historic Preservation Division, and the Georgia Department of Transportation.

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At a minimum, an agricultural property eligible under Criterion A must retain a high degree of integrity of location, setting, feeling, and association. In addition, it should possess sufficient integrity of design, workmanship, and materials for the extant physical features on the property to remain as a visible and tangible link to the past and represent the significant historical agricultural operations that took place on the property.

The main building of the property should be on its original site. Relocation to another site is acceptable if the move occurred within the period of significance. If, however, the move occurred outside the period of significance, the relocation of the main building would not automatically negate the property's eligibility under Criterion A, as long as the key and most functionally important outbuildings survive, are relatively unaltered, and remain at their original location. Historically, many ancillary buildings on agricultural properties were designed to be moved and reused as needs arose. Changes in the location of these buildings could reflect shifting agricultural patterns, and as long as these changes occurred within the period of significance, integrity of location would remain intact.

An agricultural property that meets Criterion A must retain integrity of setting to be eligible for the NRHP. Setting is evaluated by the spatial organization within the entire property, which consists of the two clusters of buildings (domestic and agricultural work zones) and the surrounding landscape. The property must retain its original relationship among buildings, natural features, and landscape elements and should have a clearly defined circulation network between these zones. The introduction of new buildings, structures, land-use patterns, and circulation networks that do not date from the period of significance can diminish the integrity of setting depending on the number, location, and visual prominence of these changes. The combined effect they have to the property and its overall character must be taken into consideration and could be so severe that the property no longer retains sufficient integrity under Criterion A. Parcels of land immediately adjacent to and surrounding the agricultural property also can affect integrity of setting for a property significant under Criterion A. The construction of a residential suburban neighborhood or a commercial development can diminish the ability of a historic agricultural property to present the qualities that make it significant; however, such intrusive elements on surrounding parcels would not necessarily compromise this aspect of integrity if the boundary demarcations of the property from the period of significance survive and make the property distinct from its surroundings (*Figure 6-30*). Integrity of setting often is associated with continuity of use; however, continuous farming relying on modern methods or techniques may have destroyed historic landscape elements or changed internal patterns of circulation and construction. In such cases, integrity of setting may be negatively affected.

Integrity of feeling refers to the ability of an agricultural property to convey a sense of the time and place from when the property achieved significance. The combined effect of changes and alterations to the man-made elements to the property, land uses and activities, circulation networks, and other attributes can diminish the ability of the property to present its historic character. Taken individually, these changes may not be that extreme or severe, but collectively may have a profound effect on the

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entire property's integrity of feeling. An agricultural property that lacks integrity of feeling will not be eligible under Criterion A.

Association is another important aspect of integrity when evaluating an agricultural property under Criterion A. As previously mentioned, a property should be sufficiently intact to reflect its historic land use and should retain the essential and character-defining historic landscape features that are related to agriculture. Although changes in the agricultural use of the land, such as changing crop types, are acceptable, the landscape must show a continued association with agriculture since the period of significance. It is not required that the farmstead retain its original acreage amount, but the remaining acreage must be large enough to convey the major agricultural functions of the property (*Figure 6-31*).

An agricultural property significant under Criterion A must also retain integrity of materials, design, and workmanship to a sufficient level that enables the property to convey a sense of time and place. Changes and alterations to the physical characteristics of the built environment cannot be so severe that the extant buildings, structures, and objects lack the ability to demonstrate or represent the historically significant agricultural operations and activities that occurred on the property during its period of significance. These aspects are not necessarily confined to the above-ground features. The manipulation of the land through contouring and construction of stock tanks in pastures, for example, can affect integrity of design and materials.

Eligibility under Criterion B

An agricultural property significant under Criterion B within this context is notable because of the property's direct association with a life of an important individual whose contributions are related to farming, ranching, or dairying. At least two of the three components of any agricultural property should retain sufficient integrity to convey significance. Integrity thresholds for a property significant under Criterion B are similar to those for a property significant under Criterion A. Those aspects dealing with more tangible qualities of an agricultural property are not as important as those that are more closely tied to the historical associations. Thus integrity of location, association, feeling, and setting typically are more important. However, the other aspects of integrity (design, materials and workmanship) should also retain enough of their character-defining features for the property to convey a sense of the past from when it achieved significance.

Eligibility under Criterion C

An agricultural property can be significant under Criterion C if it contains noteworthy, distinctive, or representative examples of architecture in its domestic and agricultural outbuildings, or recognizable trends in its historic agricultural landscape. In order to convey its significance, the property must minimally retain integrity in the areas of design, workmanship, and materials. Additionally, it should also possess a sufficient level of integrity of feeling to convey a strong sense of time from when the property achieved significance

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Integrity of design is reflected in both the individual buildings and structures, as well as the overall pattern of spatial organization relative to the layout and configuration of the property and the buildings' relationship to the surrounding landscape. The alteration or demolition of historic-age buildings or the introduction of modern buildings can negatively affect integrity of design (*Figure 6-32*). In such instances, it is not only important for the remaining historic-age buildings to reflect the property's period of significance, the landscape features should also be clearly intact, especially if significance is derived from the design-related qualities of the land (e.g., innovative uses of contouring to combat erosion). Although minor changes in land use will generally not affect the overall design of the landscape, larger changes such as loss or modification of boundary demarcations, adjustments in circulation patterns, or major changes in vegetation-related-to-land-use can all have negative effects on a property's integrity of design. This aspect may also be reflected in the cultural traditions of the people who occupied the land during its period of significance. If this is the case, then these cultural traditions would need to remain intact in order to maintain integrity of design.

Integrity of workmanship typically is applied to the historic buildings, structures and objects that demonstrate the particular skills and techniques of the individual who constructed such resources at the time the property achieved significance. The Central Texas area contains many noteworthy examples of vernacular, folk, popular and even high-styled buildings that reflect the rich architectural heritage of the region (*Figure 6-33*). If significant under Criterion C, an agricultural property must retain a high level of workmanship to meet integrity thresholds for NRHP eligibility. Workmanship is not only inclusive of the way buildings, structures, and objects are constructed, but also is evident to the practice of agriculture, such as crop rotation, contour planting, garden or pond construction, or landscape planning. Like integrity of design, workmanship is often reflected in the cultural traditions present in historic-age buildings and structures on the property. In order for a property to retain integrity of workmanship, these practices dating to the period of significance must be intact. While certain practices of agricultural workmanship, like crop rotation, may no longer survive, physical aspects such as fence construction should remain.

For a resource significant under Criterion C, integrity of materials must be maintained for it to be eligible for inclusion in the NRHP. For example, building construction from the pre-railroad era typically utilized indigenous materials, such as native woods and locally quarried stone (*Figure 6-34*). It is imperative that these materials remain on the main house (if the house exists), at the very least. On the other hand, agricultural outbuildings were often deconstructed and the materials repurposed for other buildings or uses. As long as these changes occurred during the period of significance, integrity of materials remains intact. Organic materials related to boundary demarcations or circulation patterns may also enhance integrity of materials, although the loss of original vegetation will not necessarily detract from the property's integrity.

The combined effect of changes to the buildings can diminish integrity of feeling to such an extent that it no longer retains the physical qualities and characteristics that are the source of the property's

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significance. In addition, any building or structure should be on the same location it was during the period of significance. The remaining aspects of integrity (association and setting) remain important but are not as critical as the others.

STEP 7. DETERMINE AND JUSTIFY PROPERTY BOUNDARIES

The boundaries of an NRHP-eligible agricultural property must include a sufficient amount of land that enables the property to convey its significance. The amount of area to be included depends primarily on the reasons a property is eligible for the NRHP. For example, a farm that derives significance because it embodies the essential characteristics and qualities of a Blackland Prairie cotton farm from the early twentieth-century must have boundaries that encompass the domestic work zones, the agricultural work zone, and the associated land that the farmer used to grow cotton. As noted in National Register Bulletin 16A, it is important to “select boundaries that encompass the entire resource, including both historic and modern additions. Include surrounding land historically associated with the resource that retains integrity and contributes to the property’s historic significance.” The three steps to define boundaries of agricultural properties rely on observations from field investigations, analysis of maps and aerial imagery, and research of legal and tax documents. This process confirms the existing legal boundaries of an agricultural property and provides the basis for determining property limits during the period of significance.

The initial step of defining property boundaries actually begins during the research design phase when, through desktop mapping, the historian develops a sense of the acreage presently associated with an agricultural property by noting existing conditions. Among the factors subject to scrutiny include existing roadways, land-use patterns, natural features, spatial relationships between the work zones and adjoining lands, and areas enclosed by fences. Aerial images from such online sources as Google Maps, Google Earth, and Bing Maps provide an effective and readily accessible means of discerning important landscape features and patterns. Based on these observations, parcel boundaries that have endured over extended periods of time may seem to be relatively well established. For example, the Westphalia community in Falls County contains a significant concentration of relatively small, family-run farms, many of which date back to the late nineteenth century. The limits of these farms typically encompass rectangular-shaped areas that conform to the existing county road network (*Figure 6-35*). The farm placement and sizes reveal very distinct and recognizable patterns that demonstrate remarkable stability and consistency over time. However, such patterns are far from typical in Central Texas as the dynamic tradition of agriculture in the region often contributed to changes in the size and limits of agricultural properties. This trend forces the historian to gather additional information from other sources and undertake more detailed analysis to supplement observations from the field and current aerial images.

Current tax appraisal district maps and data are good supplemental sources because many appraisal districts have such information available online. Most appraisal districts post GIS-generated maps online that depict current parcel boundaries. For those that do not have electronic maps, the appraisal district

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office will have hard-copy maps that show existing parcel boundaries. While this information is useful, additional research is necessary to determine the boundaries during the period of significance. Tax and legal records often contain parcels used for homestead exemptions that have little or no bearing on historic agricultural patterns. Therefore, the historian must also review deed records, land-surface ownership (Tobin) maps, USGS topographic maps, and historic aerial photos to learn more about land-use patterns and property boundaries. Historically, it was common for land to be subdivided among heirs; therefore, multiple boundaries may have existed during the period of significance (see *Figure 6-14*). If this is the case, then the largest amount of area associated with the historical operations of the property that retains the highest level of integrity should be considered.

The process of documenting how property boundaries changed over time is another crucial step in this task. The historian should compare current legal parcels, plat maps, and aerial photos with their historic counterparts. If the current property boundaries, including the agricultural fields, pastures, and areas, remain the same as those from the period of significance and encompass an area that retains sufficient integrity to convey significance, then they should be used. When justifying the use of historic boundaries, it is important to review the land-use changes since the close of the period of significance to be certain that the boundaries encompass an area that meets the integrity thresholds established in the previous section.

If it is not possible to use the property's existing boundary lines because of either an expansion or reduction of historic acreage, several other methods can be used to determine and justify boundaries of NRHP-eligible properties. Natural and manmade features such as fences, walls, tree lines, creeks, and roads commonly marked historic boundaries and are useful tools when determining the boundaries of an NRHP-eligible property. Even cartographic features on USGS maps have been used to delineate property boundaries. The Upper Settlement Rural Historic District within the Norse community in Bosque County is an example of such a method. The National Register nomination, which was prepared in 1983, used the contour line that largely defined the southern limits of a valley where a large number of Norwegian immigrant families settled as early as the 1850s. The settlers reportedly chose this location because it reminded them of their native lands. Land-use patterns and a long-standing perception among the original settlers and their descendants largely relied on the valley as a way to define the community and thus made sense to justify NRHP boundaries, in this case.

The delineation of boundaries must be a deliberative and historically justified process because proposed transportation-related projects have the greatest potential to have adverse effects to historic properties along the boundaries. Road widening projects can harm natural or cultural landscape features that are character-defining elements and are important to understanding the significance of a property. An entrance gate, stone fencing, or even tree plantings are among the kinds of physical attributes that must be taken into account when establishing the boundaries. Other possible boundaries include edges of new development, such as a residential subdivision or a newly constructed roadway. When neither of these approaches work, arbitrary lines drawn between two points (such as the end of a stone wall and a

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hedge row), based on professional judgment, can be used. At a minimum, the boundary lines should include all contributing resources and enough associated landscape to convey the property's significance.

If a non-historic roadway intersects the resource but both sides still retain sufficient integrity to convey the significance of the property as a whole, then the boundary should encompass the entire property and classify the roadway as a noncontributing resource.

STEP 8. CLASSIFY RESOURCES AS CONTRIBUTING OR NONCONTRIBUTING ELEMENTS

Every resource on an agricultural property that is eligible for inclusion in the NRHP must be inventoried and classified as either a contributing or noncontributing element. Generally speaking, a majority of the inventoried resources on an agricultural property should be classified in the contributing category; however, the number is not as important as the role and importance each resource represents in defining the historic character of a property. Such an approach will allow a large number of small and relatively insignificant resources on an agricultural property to be classified as noncontributing elements as long as the primary buildings and structures that represent the historic core of the property retain their salient features. The key part of this evaluation is the overall character and quality of the property and its ability to convey its significance and sense of the past.

Contributing Resources

A resource classified in the contributing category must retain the majority of the salient and character-defining features that identify it as an example of one of the associated property types and enable it to enhance an agricultural property's ability to convey significance. The degree to which the resource must retain character-defining features is directly dependent on applicable National Register Criteria, the property type classification, the frequency and severity of changes and alterations, its function and role, and how it relates to other resources on the property.

Noncontributing Resources

A resource classified in the noncontributing category includes those properties that were built after the agricultural property's period of significance or are historic resources that are so severely altered that they lack integrity and detract from the property's historic character.

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Figure 6-1. Aerial showing land-use patterns of the Steubing Farm in Bexar County. This farm is eligible for the NRHP under Criterion A at the local level of significance as a good example of an early twentieth century, mixed-use agricultural complex, with evidence of both crop cultivation and the raising of livestock. (Source: <http://www.localive.com>.)

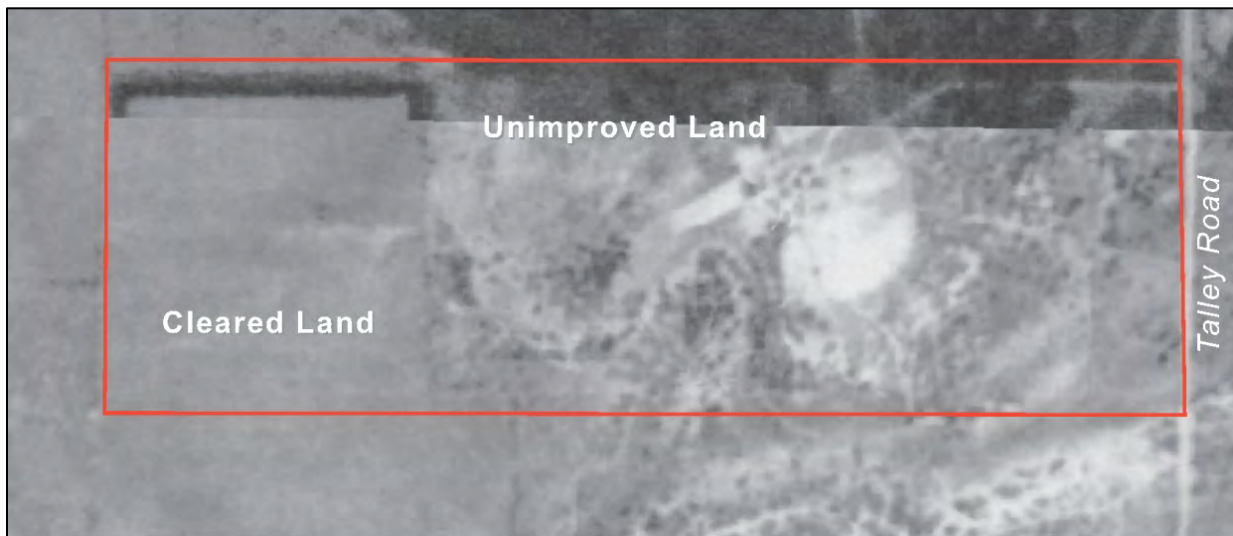


Figure 6-2. An aerial showing land-use patterns of the Steubing Farm, 1952-53. A comparison of this aerial with the 2007 aerial shows that the land-use patterns are relatively unchanged since the period of significance. (Source: <http://www.localive.com>.)

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Figure 6-3. View of the front façade of the George Wilkins Kendall House in Comal County. Kendall is significant under Criterion B at the state level because of his influential efforts to show that the region could support sheep ranching in the region. (Source: Comal County Historical Commission.)



Figure 6-4. An oblique view of a stone building on the George Wilkins Kendall Homestead in Comal County. Upon his death in 1867, he was known as the “father of the sheep business in Texas.” (Source: Comal County Historical Commission.)

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Figure 6-5. View of the front façade of the 1872 Bryson homestead in Williamson County. The house is significant architecturally because the form and plan is indicative of vernacular building traditions in Texas of the mid-to-late nineteenth century and because of the fine detail in the hand-hewn native limestone used in its construction. (Source: TxDOT.)



Figure 6-6. View of the cistern on the Bryson farmstead. It is located at the southeast corner of the main house and is considered contributing to the historic farmstead. According to Section 5, Property Types, cisterns are commonly located near the main house and early examples are usually of masonry construction. In later years, many agriculturalists constructed raised cisterns that rested on wooden supports. (Source: TxDOT.)

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Figure 6-7. Contextual view showing a ca. 1980 manufactured home in Williamson County contrasted against ca. 1950 outbuildings. The historic-age buildings reflect earlier agricultural-based patterns and, therefore, should mark the beginning of the property's period of significance.

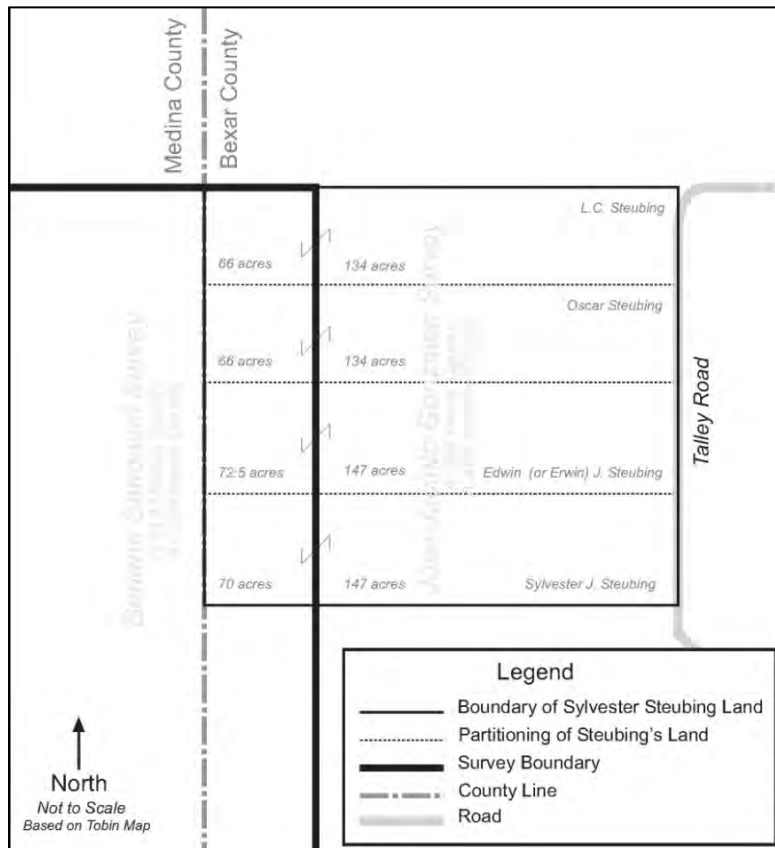


Figure 6-8. This map shows the partitioning of Sylvester Steubing's land in Bexar County to his sons in 1923. It was an important event as described within the historic context and helps to define the property's period of significance.

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Figure 6-9. An interior view of a barn located on the E. W. Raney Farmstead in Caldwell County. This view, one of a series of photographs taken from HABS documentation prepared for the property, highlights the presence of a crib, a feature that is characteristic to the layout of a side-entry barn.



Figure 6-10. An aerial view of a farmstead in Guadalupe County showing the construction of a modern house (#1) in proximity to the house and barn (#2) historically associated with the property. The presence of these modern buildings overwhelms the property's historic fabric. (Source: Bing Maps.)

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Figure 6-11. An aerial photograph that depicts modern development surrounding the historic Mason Farmstead in Williamson County. The loss of historically associated land formerly used to cultivate crops, combined with the effect of surrounding development, compromises the property of its historical setting. (Source: Bing Maps.)



Figure 6-12. View of main façade of a chicken coop in Comal County. This image illustrates the recycling and reuse of materials that is commonly found at agricultural properties. (Source: Comal County Historical Commission.)

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Figure 6-13. View of stone fence in Comal County. This type of fencing displays highly skilled craftsmanship that is closely related to agricultural practices. (Source: Comal County Historical Commission.)



Figure 6-14. View of single-family dwelling in Comal County. This building has been modified with the addition of a second story, second floor balcony, multiple additions, and replacement windows. As such, it does not retain sufficient integrity of materials and design to illustrate the craftsman's skills and talents, and, therefore, has lost its integrity of workmanship. (Source: Comal County Historical Commission.)

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Figure 6-15. An aerial photograph depicting current property boundaries of an agricultural farmstead. The main house roofline is shown in yellow. (Source: Bing Maps.)



Figure 6-16. A 1937 Tobin aerial photograph with the current property boundaries shown in red. As illustrated when compared to the current aerial image, the loss of historic-age buildings at the north end of the land, combined with the addition of non-historic age buildings, negatively affects property's integrity of feeling. (Source: P2 Energy Solutions.)

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Figure 6-17. An aerial photograph showing land-use patterns within the four parcels of the original Sylvester Steubing Farm in Bexar County. While the bottom three parcels remain largely agricultural, the top parcel is intensely developed. This development negatively affects its integrity of association. (Source: <http://www.localive.com>.)



Figure 6-18. Aerial photograph showing active agricultural fields (#1) and their link to the adjacent building and structures (#2). The **land use and activities** of the agricultural fields over time should reflect the historic context and the period of significance in order to remain intact. Changes to the characteristics of the land may sever the historical association that makes it significant. (Source: Google Earth.)

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Figure 6-19. Aerial photograph showing power lines running through an agricultural field, disrupting historic **patterns of spatial organization** and detracting from the property's integrity of setting, feeling, and association. (Source: Google Earth.)

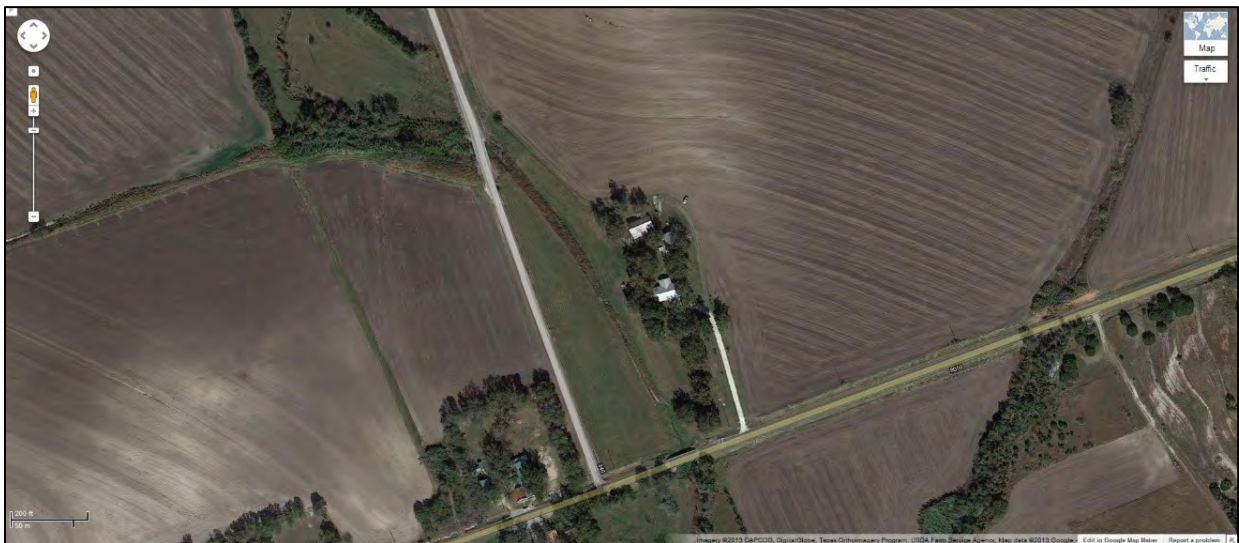


Figure 6-20. As exhibited in this aerial photograph, farmers often altered the landscape in **response to the natural environment** by terracing the land to combat erosion. Other examples include the construction of windmills to provide sources of water for livestock, and constructing stock tanks for water and soil conservation. (Source: Google Earth.)

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*Figure 6-21. Photograph of a fachwerk house on a historic farmstead. Many German immigrants who settled in Central Texas during the mid-nineteenth century used this type of construction to build their residences. Fachwerk, which features a half-timbering framing system with brick, stone, or other materials as infill, was a popular vernacular building form of these early pioneers and reflected the **cultural traditions** of these German-speaking settlers.*



*Figure 6-22. Photograph of a smokehouse associated with a nineteenth-century farmstead. Smokehouses, washhouses, spring houses, and cellars are a few examples of buildings that also reflect **cultural traditions** in the construction methods, forms, materials, and styles. These resources enable historians to develop a better and a more complete understanding of the history of the property and its occupants.*

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Figure 6-23. Aerial photograph showing internal **circulation networks** on a historic ranch. Internal networks are generally used to transport people, goods, and materials and can be in the form of dirt roads and paths, driveways, and foot paths. External networks, such as roadways and railroad lines, often influenced the location of agricultural properties and land use. (Source: Google Earth.)



Figure 6-24. Photograph of a stone fence surrounding a chicken house. Internal **boundary demarcations** are used to delineate distinct zones within an agricultural property. Although wood posts with barbed-wire fencing are the most common types of materials used, metal poles, electrical fences, and even labor-intensive stone fences are also used. (Source: Comal County Historical Commission.)

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Figure 6-25. Aerial photograph showing natural **boundary demarcations** created by the river. Many agricultural properties make use of natural features to delineate boundaries and can include drainages, a grove of trees or shrubs, or depressions and uplifts in the land. (Source: Google Earth.)



Figure 6-26. Aerial photograph showing **vegetation related to land use**. Vegetation includes crops, trees, shrubs, or grass that was intentionally planted for agricultural or domestic purposes, as well as native grasses, trees, and other plants that have grown along boundary demarcations, or in pastures and abandoned fields. (Source: Bing Maps.)

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Figure 6-27. A photograph of a chicken coop, shed, and house at the Sherrill Farm, Guadalupe County. **Buildings, structures, and objects** include resources associated with serving human, animal, and crop storage needs related to the operation of agricultural properties. These resources provide a link to the historic activities, cultural traditions, and skills of the people who used them.



Figure 6-28. An aerial view showing a building **cluster**. As evident in the photograph, this cluster consists of two distinct groupings delineated by a fence; a domestic work zone (#1) and an agricultural work zone (#2). A third zone, fields/pastures (#3), is seen surrounding the building cluster. (Source: Bing Maps.)

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Figure 6-29. View of a ranch fence and gate. **Small-scale elements** such as ranch gates, signs, abandoned machinery, and cattle guards add to the historic setting of a property and help provide a comprehensive historical link to the period of significance. Due to the small nature of these objects, it is not uncommon for them to be moved, removed, or have suffered from deterioration. (Source: Comal County Historical Commission.)



Figure 6-30. Aerial photograph showing a recent residential subdivision constructed adjacent to agricultural fields. The construction of a neighborhood or commercial development can diminish the integrity of setting of an agricultural property. However, if the boundary demarcations of the property are intact from the period of significance and make the property distinct from its surroundings, then integrity of setting may not be compromised to a point that makes the property ineligible for listing in the NRHP. (Source: Google Earth.)

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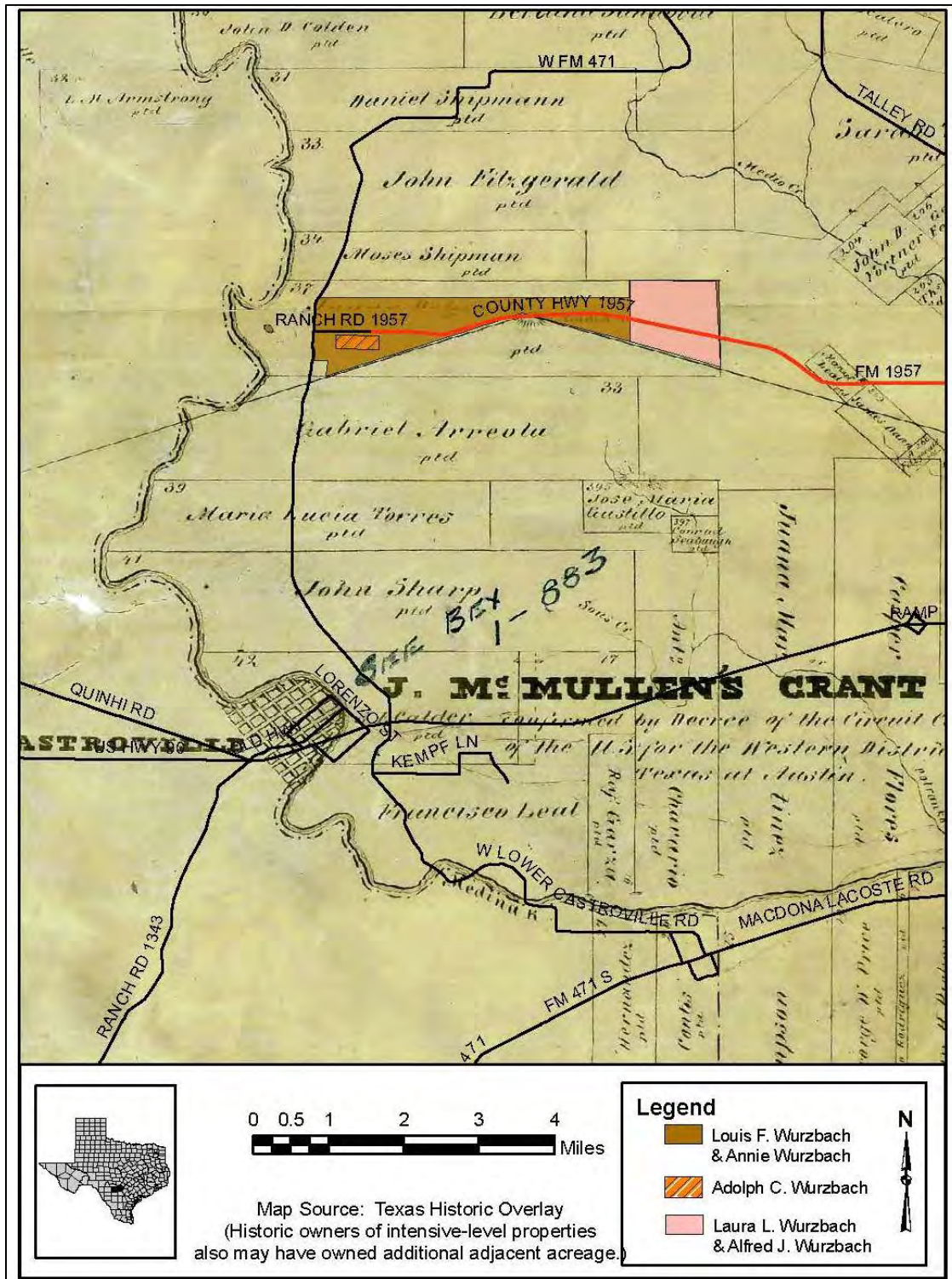


Figure 6-31. GIS-based map overlay showing how parcel boundaries have changed over time. Although it is not required that a farmstead retain its original acreage amount, the remaining acreage must be large enough to convey the major agricultural functions in order for association to remain intact.

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Figure 6-33. Photo of a nineteenth century vernacular house in Comal County. This house reflects the rich heritage of the region and retains a high level of workmanship. (Source: Comal County Historical Commission.)

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Figure 6-34. Photo of a ca. 1850 house in Comal County. This house exhibits the use of indigenous materials, including native wood and locally quarried stone that is typical from the pre-railroad area in Central Texas. (Source: Comal County Historical Commission.)



Figure 6-35. Aerial photo showing property boundaries in Westphalia, Falls County, that reveals historic land-use patterns. The limits of these farms typically encompass rectangular-shaped areas that conform and/or influenced the local road network. (Source: Google Earth.)

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CASE STUDIES: RECONNAISSANCE- AND INTENSIVE-LEVEL INVESTIGATIONS AND ANALYSES

INTRODUCTION

The following three case studies provide actual examples of TxDOT-sponsored reconnaissance- and intensive-level investigations and analyses that apply the steps and procedures described in previous chapters of this report. Each example includes an agricultural property that was documented and evaluated during non-archeological historic resources surveys for transportation undertakings, and adapts it to these guidelines. Each of the properties was subject to TxDOT review and coordination with the SHPO and consulting parties, as appropriate. While any property is unique with its own distinct history and physical characteristics, the process of gathering pertinent information, applying the National Register Criteria Evaluation methods and Seven Aspects of Integrity, and making NRHP-eligibility recommendations should be consistent, accurate, and thorough for all agricultural properties. The steps developed in these guidelines and applied in these case studies will help historians provide TxDOT with the kind of information needed to identify, document, and evaluate historic agricultural properties and consider potential impacts for roadway projects.

Although each case study follows the steps described in these guidelines, the format presented is not intended to be used as a template for future reports. Instead, these case studies demonstrate the deliberative thought process and the analytical approach that historians should undertake for historic agricultural properties.

Case Study 1 showcases a property documented for a reconnaissance-level survey in eastern Travis County and illustrates the process of developing a research design, conducting fieldwork, and evaluating resources when only reconnaissance-level background information is required to assess NRHP eligibility. Case Studies 2 and 3 showcase intensive-level investigations and have a slightly different presentation and organization from the other example because they focus on the evaluation process. The steps delineated in these case studies are designed for a transportation undertaking that may affect character-defining features of an NRHP-eligible property and thus be subject to Section 4(f) analysis. As such, they are intended to obtain the kind of information needed for projects with Section 4(f) implications. Case Study 2 describes an intensive-level survey with right-of-entry access to a private farmstead. The narrative documents the physical integrity of each surveyed resource at an intensive level and considers aspects of a rural historic landscape. Case Study 3 illustrates how an intensive-level investigation can be completed without right-of-entry access. This analysis relies on more indirect means, including examining and analyzing historic and current maps and photographs that document the physical evolution of the property consistent with NPS guidelines for rural historic landscapes.

CASE STUDY 1: RECONNAISSANCE-LEVEL INVESTIGATION OF AN AGRICULTURAL PROPERTY

Historic Resources Survey Report, FM 969 from FM 3177 (Decker Lane) to SH 130, Travis County, Resource ID No. 23a-I

Project Background

This case study presents the results of a reconnaissance-level survey that involved an evaluation of an agricultural property in east-central Travis County in 2006. Impetus for the survey stemmed from a proposed TxDOT improvement project along FM 969 (*Figure 7-1*). The project proposed to improve FM 969 by upgrading to a six-lane divided urban road with turn lanes and median breaks; it was to include a grade-separated interchange at FM 973. At the time of the survey (2006), the existing right-of-way of FM 969 was 100 feet wide; the new ROW was to be 200 feet wide. The Area of Potential Effect (APE) or total project limits included approximately 2.6 miles of FM 969 from FM 3177 (Decker Lane) to SH 130. The width of the APE extended 150 feet on either side of the right-of-way.

The FM 969 Travis County project encompassed both intensely developed commercial, residential, and State property and less developed agricultural land between FM 3177 on the west and the newly constructed SH 130 on the east. Until the early twentieth century, the study area was a rural agricultural landscape that was east of a north-south-running rail line and was located along a road that led from Austin on the west to the vicinity of Hornsby's Bend on the east; the road may have been a historic route that extended to the town of Bastrop. In the 1930s, the western portion of the survey area was selected as the location of a state farm colony. Subsequently, tracts of formerly rural land were developed as platted subdivisions. Other tracts, some of which were owned by descendants of nineteenth-century residents, remained agricultural.

In general, the western part of the project corridor was characterized by dense institutional architecture, trailer parks, and modest-sized housing, with a minimum of commercial development. The corridor continued on FM 969 heading generally east through a mixture of agricultural land in large tracts and small residential and commercial tracts to the intersection of FM 969 with FM 973. The balance of the corridor between FM 973 and the new SH 130 right-of-way was generally agricultural land.

Summary of the Project

The Project entailed development of a research design, historic contexts, field survey, and evaluation of the NRHP eligibility of recorded properties. Identification efforts of the reconnaissance-level survey addressed buildings, structures, objects, and non-archeological sites and districts. The APE extended 150 feet on either side of the right-of-way, and properties lying outside the 150-foot boundary that were on tracts contiguous to the APE also were surveyed. All historic resources 50 years of age or older within the APE and contiguous areas were recorded. With a letting date of 2010, the 50-year cutoff for the survey was 1960. During the field survey, 138 individual properties were recorded. The project historian

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was allowed limited right-of-entry to the properties. As a result, the report of findings and recommendations of eligibility were based on historical research and examination of the buildings, structures, and objects.

STEP 1: PREPARE RESEARCH DESIGN; REVIEW AND CRITICALLY ASSESS INFORMATION GATHERED DURING TASK

Questions to Guide Collection of Data for Preparation of a Research Design

- What archival resources are available that provide information about the history of eastern Travis County generally and the study area specifically?
- Where are those resources located?
- What information do the resources provide about previously recorded historic properties?
- Based on the research, what is the range of historical activities that occurred in the study area?
- To what extent are those activities typical or atypical of Travis County and Central Texas?
- Do any of the activities suggest the potential presence of resources not commonly found in Travis County and Central Texas?
- Based on the research, what is the range of architectural resources represented?
- What appears to be the chronological range of the resources?
- What appear to be the broad land-use patterns?
- Are any of those patterns linked, based on the ownership and use of the property?
- Do the resources and dominant patterns appear to date prior to or after the historic period?
- Based on data collected for the research design, is it possible to identify a preliminary list of historic contexts appropriate to the cultural resources previously identified and visible in the field?

Preparation of a Research Design¹

Preparation of a research design involved archival research that included reviewing records at the Texas Historical Commission (THC) to identify previously documented National Register of Historic Places (NRHP) properties within the APE, locations of recorded cemeteries and Recorded Texas Historic Landmarks (RTHLs), and other marked properties. It also involved reviewing published inventories of the Texas Department of Agriculture (TDA), Texas Family Land Heritage program to identify the presence of heritage properties in the study area. Other sources used to prepare a research design included United States Geological Survey (USGS) topographic maps dated 1910 (field work in 1895-1896), 1955, 1966 (field checked 1968) (*Figure 7-2*), 1973, and 1988; a Soil Conservation Service (SCS) aerial dated 1958; and an aerial photograph dated 1962. Primary and secondary source literature was reviewed at the THC, Austin History Center (AHC), General Land Office (GLO), and Texas State Library and Archives (TSLAC).

¹ For a more-complete description of steps associated with pre-fieldwork activities, see Task 5 of the *Agricultural Theme Study for Central Texas, Field Methodology*.

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Reports of highway projects that were contiguous to or within this project were reviewed and copied at TxDOT.

Primary and secondary source literature that was reviewed provided a broad outline of the history of Travis County generally and the study area specifically, including data about the history of settlement and transportation, development of agriculture, and the use of a portion of the area for state eleemosynary purposes. Comparisons of the five USGS topographic maps (see *Figure 7-2*) and two aeriels provided graphic representations of the historic appearance of the survey area and documentation of transportation routes, development of road infrastructure, location of apparently agricultural land, and transformation of that landscape by mid-twentieth-century suburban construction.

Limited archival research during the research design phase, coupled with preliminary identification of cultural resources that had been recorded or marked previously resulted in identification of five potential themes or historic contexts that could be used to direct more-detailed research and to provide a framework by which patterns in settlement, land use, and other historic trends could be traced and understood.² The themes also helped to identify potential property types that might be encountered in the field. These themes included:

- Early Settlement (1892-1900),
- Twentieth-Century Settlement (1901-1960),
- Agriculture (1832-1960),
- Transportation (1832-1960), and
- State Eleemosynary Activities (1933-1960).

Research also suggested that the area was racially mixed, with earliest settlement by Anglo-Americans associated with Austin's Colony complemented by an African-American enslaved population.

Questions Raised During Preparation of a Research Design

- What do overlays of USGS topographical maps from 1955, 1968, 1973, and 1988 and aerial photographs dated 1958 and 1962 on a current project aerial identify as architectural resources from the historic period?
- What does an analysis of those overlays have to say about development of the cultural landscape?
- To what extent did twentieth-century development occur proximate to FM 969, and to what extent have larger tracts of land survived?
- How has the economy of the area changed?

² For the purposes of this case study, any historical themes or contexts not associated with agriculture will not be included in this document. The historic resources survey report includes the complete results of the reconnaissance-level investigation. Therefore, the information presented in this chapter is edited and focuses exclusively on agriculture-related themes.

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- What have been the primary drivers (i.e., construction of a state institution, agriculture, suburban growth, commercial development) of change in the study area?
- To what extent was the Austin State School Farm Colony an influence on both residential and commercial development and on the persistence of agricultural land and activities?

STEP 2: DEVELOP PRELIMINARY HISTORIC CONTEXTS

Historic contexts identify the major themes, patterns, and events that have influenced historic activities in the study area. They also explain how the buildings, structures, and landscapes are physical and tangible links to those themes, patterns, and events. Although the historic resources survey report included two historic contexts, the only one included in this case study deals exclusively with agriculture and is presented below.

The historic context, *Agriculture, 1832-1960*, was suggested by the history of the study area and presence of numerous tracts of land that were still used for agricultural purposes in 2006. Agriculture in Travis County dominated the economy until at least 1900. The earliest of the county's agricultural communities lay within and adjacent to the study area, where settlers raised corn and grains in the fertile soils and supplemented those crops with cotton and wheat (Hardy 1938:142-143). By the mid-1850s, sheep and cattle were important components of the agricultural economy (Anonymous 1968:11). The agricultural community was racially mixed due to a large number of slaves (39 percent of the total population) and remained so after the Civil War when many former slaves remained in their traditional agricultural communities.

Farm and livestock values fell precipitously in Travis County after the Civil War, but by 1880 the agricultural economy was recovering due to the arrival of the Houston and Texas Central Railroad in 1871 and the International and Great Northern in 1876. By the late 1880s, cotton was the principal field crop, and it remained dominant until the 1930s, when farmers turned increasingly to the raising of cattle. The number of cattle in Travis County increased from 32,000 in 1920 to 51,000 in 1950 (Smyrl 1996a:553-555), and the study area saw a similar increase of interest in ranching as owners improved their land with livestock-related features.

Most of the twentieth-century agricultural landscape of Travis County reflected the activities of private landowners; however, the 1930s brought a trend towards public ownership of large tracts of land. The State encouraged self-sufficiency at several eleemosynary institutions in Austin and Travis County through the creation of patient-operated agricultural facilities. Some of the facilities were operated on-site or very near the State Hospital, which was the parent institution. Others, such as the Austin State Farm Colony that began operation on FM 969 in 1934, were located off-site and embraced hundreds of acres of agricultural land. They remained agriculturally viable until the late 1960s.

The survey identified eight properties in the study area that could be associated with the historic context, *Agriculture, (1832-1960)*. These included several farmsteads with multiple components, a ranchstead, and a granite marker commemorating Austin colonist Reuben Hornsby and the Hornsby's

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Bend settlement. Several of the properties may have been operated privately or may have been associated with the agricultural operations of the Austin State Farm Colony, which was the largest of the agricultural properties in the survey area.

Questions to guide development of preliminary historic contexts:

- Is there evidence of farming, ranching, dairying, or other agricultural activities?
- What evidence is there of changes in land use from agricultural or institutional to suburban and other development?
- What evidence is there of shifts within agricultural use – for example, from farming to ranching?
- Are the functional areas of representative agricultural properties still evident?
- Are buildings and structures that support agricultural activity still evident?
- How do the individual properties connect with the transportation system that links the area to the urban center?
- Is the multi-ethnic character of the area assumed to have been present in the historic period still evident in types of properties and in the constituent population?
- What appear to be the boundaries of individual properties—both private and public—that are associated with agricultural activities?
- How do those boundaries relate to topography, creeks, the Colorado River, FM 969, and the rail line?
- Have there been intrusions on those boundaries from activities and construction postdating the survey cut-off date?

STEP 3: CONDUCT RECONNAISSANCE-LEVEL SURVEY

Following the submittal and approval of the research design, the project historian conducted a reconnaissance-level survey that involved the following four steps described in Task 5 of the Agricultural Theme Study:³

- Identification of individual properties and the general landscape.
- Documentation of the resources and landscape.
- Completion of on-site research at local repositories and collecting information from local informants.
- Preliminary assessment of the integrity and significance of individual properties and landscapes based on in-field observations and synthesis of information from those observations with data collected from pre-field research and preliminary identification of appropriate contexts.

³ For a more-complete description of the steps involved with a reconnaissance-level survey, see Task 5 of the *Agricultural Theme Study for Central Texas, Field Methodology*.

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The project historian conducted field investigations that included documentation of each property through photography and mapping of the specific resources and elements. These elements included gates and other entrances, buildings, structures, domestic and work zones, circulation networks, fields and pastures, and non-historic-age resources. The survey identified numerous historic resources within the APE and contiguous tracts. Those resources included the following types: stand-alone residences, residences with outbuildings, farmsteads, a church, a monument, an eleemosynary institution, a road, and road infrastructure elements. In several cases, resources were comprised of multiple components and appeared to be associated with one or more of the following themes within the historic context:

- Early Settlement, 1832-1900 – three properties (a granite marker commemorating the life of Reuben Hornsby and the settlement of Hornsby's Bend, a single-family residence, and a farmstead complex comprised of nine elements).
- Twentieth-Century Development, 1901-1960 – 18 properties (residences and associated outbuildings, commercial buildings, an African-American church, farmsteads, and a possible recreational complex).
- Transportation, 1832-1960 – one property, FM 969.
- State Eleemosynary Institutions, 1933-1960 – 1 property with 81 components (the Austin State School).
- Agriculture, 1832-1960 – eight properties (farmsteads and their associated outbuildings and site features).

Association of a number of properties with two of the primary historical themes (*Agriculture, 1832-1960, and State Eleemosynary Institutions, 1933-1960*) brought a degree of complexity to the question of the historic contexts that best explained the properties. As a result, it was not always clear whether properties that appeared to be associated with *Agriculture, 1832-1960*, might not be associated with *State Eleemosynary Institutions, 1933-1960*, as well.

STEP 4: ASSESS SIGNIFICANCE UNDER THE NATIONAL REGISTER CRITERIA FOR EVALUATION AND CRITERIA CONSIDERATIONS

For the purposes of assessing significance of an agricultural property during a reconnaissance-level survey in this case study, the property identified as Resource ID No. 23a-I was selected. In 2006, the property was agricultural land and improvements were located on the south side of FM 969. While only a small portion of the tract fell within the APE, the entire tract was surveyed, which is consistent with TxDOT policy for transportation undertakings (*Figures 7-3 and 7-4*). As recorded in 2006, these resources consisted of a residence and outbuilding/garage, an elevated water tank, a second non-elevated water tank, a barn, a shed and corrals, water troughs, an enclosed shed, livestock corrals and scale, and an earthen tank (*Figures 7-5, through 7-11*). Fenced fields and interior dirt roads were present but not recorded as individual resources. The resources on the property appeared to date from ca. 1940.

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Criterion A

The property appeared to be an intact local example of an agricultural complex dating to the World War II era. With its essential elements intact (residence, barn, outbuildings, water tanks, sheds and corrals, water troughs, and earthen tank), the complex appeared to have been associated with the livestock industry. It reflected important changes that occurred after the 1930s, when there was an increasing emphasis on livestock raising in Travis County and Central Texas. Therefore, this complex possessed significance under Criterion A at the local level in the area of agriculture.

Criterion B

General research did not identify any important individuals associated with this property during the period of significance. Since the project historian did not conduct site-specific research on the families associated with Resource ID No. 23a-I, the property was not evaluated under Criterion B.

Criterion C

Within eastern Travis County generally and the study area specifically, the resource was an unusually extensive and complete agricultural assemblage within a larger agricultural landscape. The resource included the following elements, all of which were constructed by the early 1940s, with the exception of an earthen tank constructed after 1988, according to USGS quadrangles:

- A one-story, wood frame, gable-roofed, rectangular plan residence with a central entrance flanked by pairs of two six-over-six windows. A brick addition was located on the west façade. On the east end of the building was a small gable-roofed wing tucked under the overhang of the main part of the house and set back from the front plane. A front porch whose roof broke to a shallower pitch at the exterior wall plane was supported by four square wood columns.
- A one-story outbuilding that functioned primarily as a garage and probably included space for equipment.
- A metal elevated water tank and a secondary metal tank on a concrete pad that may have provided storage for fertilizer.
- A metal-roofed two-story barn with open bays and possible addition to the west façade.
- Open sheds and corrals.
- An enclosed shed.
- Cast-in-place concrete water troughs.
- Metal livestock corrals and scale.
- Earthen tank.

While none of the features were individually noteworthy, being typical building forms for their types, each feature exemplified construction methods that once were common within Travis County. The completeness of the elements meant that the property was an intact example of its kind from the mid-

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twentieth century. The degree to which the complex was intact was unusual in a Central Texas agricultural property and thus elevated its significance.

STEP 5: DEFINE PERIOD OF SIGNIFICANCE

The period of significance for the agricultural complex began ca. 1940, when the improvements appear to have been constructed, and extended to 1960, the historic-age cutoff date for the proposed FM 969 Improvements Project.

STEP 6: ANALYZE THE ASPECTS OF INTEGRITY

Location

Information available from USGS quadrangles show that the house, garage, barn, corrals, tanks, and sheds have not been moved since their construction. Therefore, the integrity of location remains intact.

Design

The main house appears to have experienced one alteration—a small brick addition located on the west, or rear façade. There appear to have been no additions or alterations to any other buildings or structures that were part of the agricultural complex. Therefore, the complex retained its integrity of design.

Setting

The setting surrounding the agricultural complex was historically rural and institutional; in 2006, the area's land use was transitioning to suburban development with new housing subdivisions and limited commercial construction. However, parcels adjacent to the complex remain rural or institutional in nature and include agricultural land. The historic land-use pattern appears to have remained unchanged from the World War II period, and the relationship of the property to the primary transportation corridor, FM 969, remains intact. As a result, the agricultural complex retains integrity of setting.

Materials

The residence, outbuildings, and site features appear to retain their original siding, windows, and finishes. Therefore, integrity of materials remains intact.

Workmanship

The essentially functional aspects of construction associated with the residence, outbuildings, and site features remain intact. Therefore, integrity of workmanship is present.

Feeling

The agricultural complex itself exhibits few changes since 1960. In addition, changes that have occurred to the surrounding area along FM 969 are not visible from the property and so do not intrude on it visually. As a result, the complex retains integrity of feeling.

Association

The agricultural complex retains integrity of association because its land-use patterns appear to be intact, there is sufficient associated acreage to convey its agricultural function, and the constituent parts that define the function are intact as well.

STEP 7: IDENTIFY INTEGRITY THRESHOLDS FOR NRHP ELIGIBILITY

Eligibility under Criterion A:

The agricultural complex retains a high degree of integrity in the areas of location, setting, feeling, association, materials, workmanship, and design. The residence and associated outbuildings and structures remain at their original locations. There has been no apparent change in land use, and the relationship among buildings, topography, landscape elements, and transportation infrastructure appears not to have changed since ca. 1940. Parcels of land adjacent to and within view of the complex have experienced little change. As a result, the complex conveys a sense of the time and place during which it achieved significance.

Eligibility under Criterion C:

The residence and associated outbuildings and site features do not appear to have changed since their period of significance, with the exception of a small addition on a secondary façade of the residence. With the exception of an earthen tank that is located in a remote area of the tract, there appear to have been no other buildings, structures, or site features introduced to the landscape after 1960, nor was there evidence of buildings, structures, or site features that were present in the 1940s that have been demolished. There appears to have been no change in land use since 1960. Therefore, the agricultural complex meets the integrity threshold for eligibility under Criterion C.

STEP 8: DETERMINE AND JUSTIFY PROPERTY BOUNDARIES

Boundaries for the agricultural complex are based on the parcel of land that was identified by TxDOT for the purposes of identifying the APE and associated contiguous parcels.

STEP 9: CLASSIFY RESOURCES AS CONTRIBUTING AND NONCONTRIBUTING ELEMENTS

Contributing Resources:

The contributing resources identified in 2006 comprising the agricultural complex include the main house, garage, barn, metal tanks, sheds, corrals, water troughs, and scale; additional contributing resources would have included fields, pastures, and the internal road system.

Noncontributing Resources:

The earthen tank was constructed outside the period of significance and therefore is classified as non-contributing.

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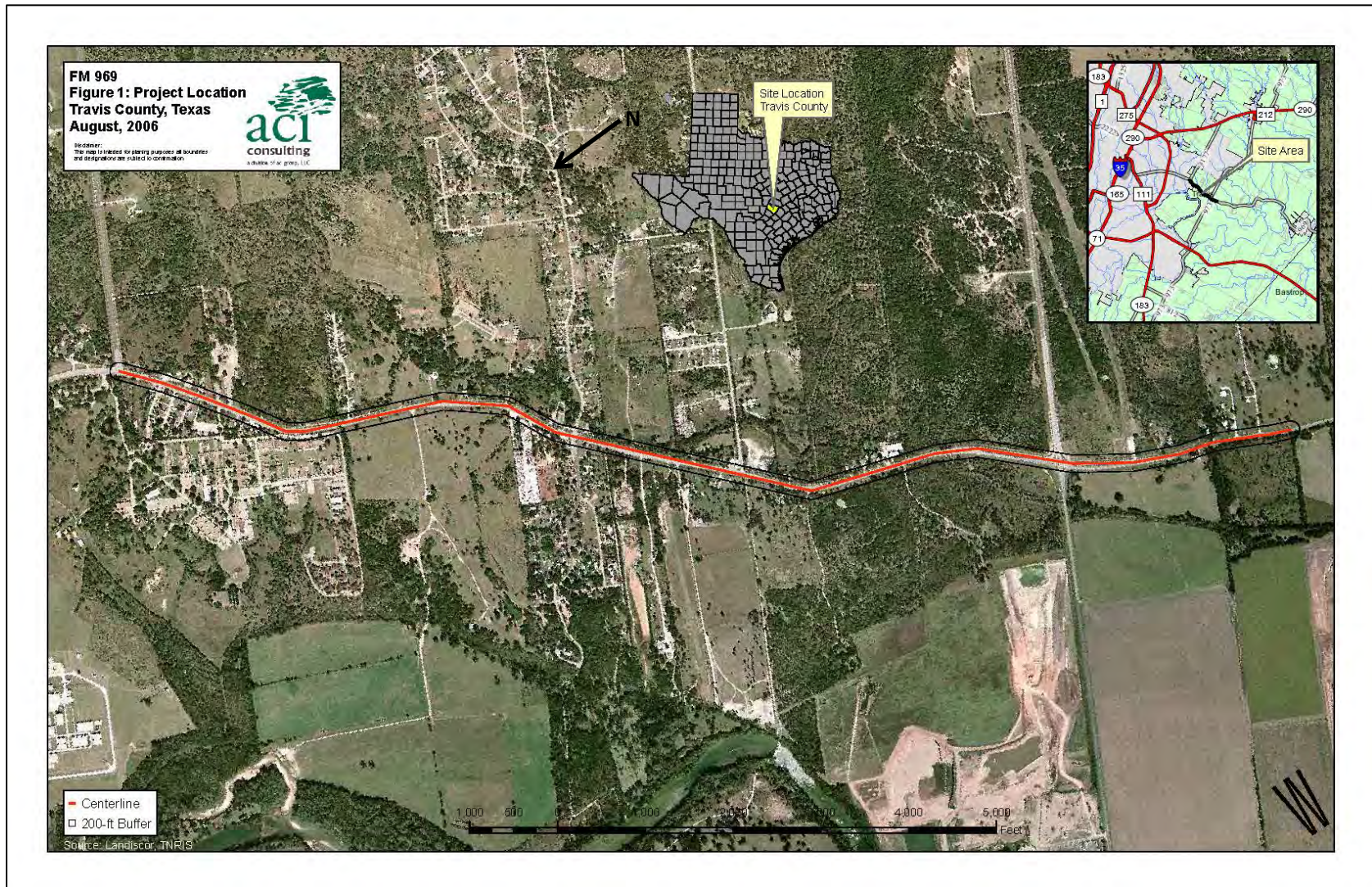


Figure 7-1. FM 969 project location, Travis County, Texas. An aerial photograph dated August 2006 depicts FM 969 in red and the adjacent landscape. The Austin State School is located on the south side of the road on the western end of the project corridor, and a portion of the Colorado River is seen at the bottom of the image. Resource ID No. 23a-I, the property analyzed in this case study, is located immediately east of the Austin State School (Freeman 2006).

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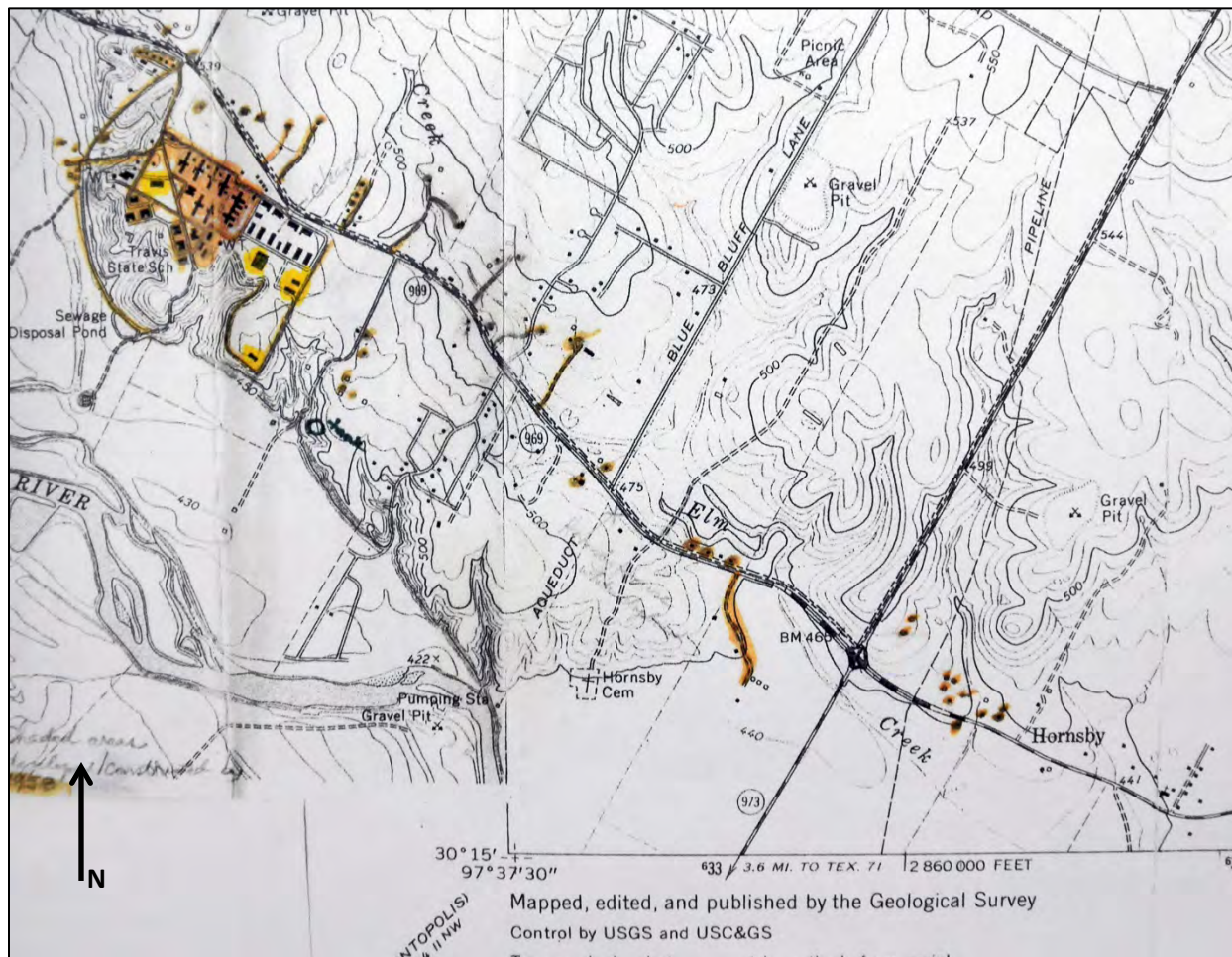


Figure 7-2. A segment of a USGS quadrangle dated 1966 and field checked in 1968 also shows cultural features such as roads and buildings that appeared on a USGS quadrangle dated 1958. They are highlighted in orange.

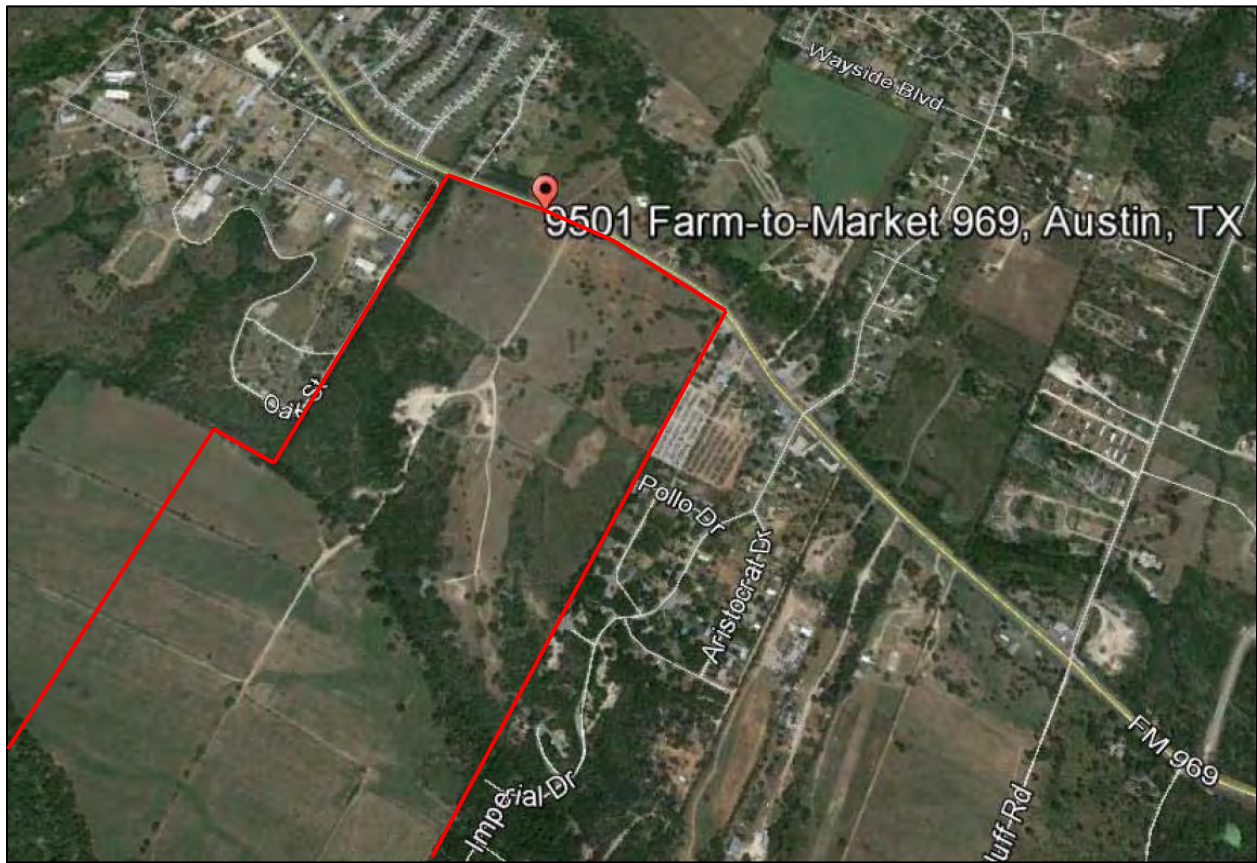


Figure 7-4. Resource ID No. 23a-I within the FM 969 project location. (Source: Google Earth, 2013.)

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Figure 7-5. Resource ID No. 23a is the residence on an agricultural property adjacent to FM 969 east of the Austin State School. The residence was a one-story, wood frame, gable-roofed, rectangular plan structure with a brick addition that was located on the rear façade.



Figure 7-6. Resource ID No. 23b is a garage located near Resource ID No. 23a and adjacent to a dirt road that provided access to the agricultural property from FM 969.

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Figure 7-7. Resource ID No. 23d is a two-story frame barn with open bays and addition on the west façade that appeared to be more than 50 years old. The gambrel roof is typical of barns commonly found on dairy farms.



Figure 7-8. The dirt road that constitutes the internal circulation system within the agricultural property on FM 969 leads to a combination shed and corrals (Resource ID No. 23e) and several other features.

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Figure 7-9. Resource ID No. 23h is comprised of livestock corrals that enclose a pasture and a scale.



Figure 7-10. Resource ID No. 23j was one of two concrete water troughs recorded on the agricultural property. The portion of fencing that remained allowed livestock to have access to water from two adjacent enclosed pastures.



Figure 7-11. An earthen tank located on the western end of the agricultural property did not appear on a 1988 USGS quadrangle and was not considered to be a contributing part of the agricultural property as a result.

CASE STUDY 2: INTENSIVE-LEVEL SURVEY WITH RIGHT-OF-ENTRY

Mitigation of Structural Historic Properties within Segments 5 and 6 of SH 130 in Caldwell and Guadalupe Counties

E. W. Raney Farmstead (Brashears House), 3253 Williamson Road, Lockhart, Caldwell County, Texas⁴

Project Background

The E. W. Raney Farmstead was documented using the National Register nomination format as part of an effort to mitigate adverse effects caused by the construction of SH 130.⁵ It was one of 10 historic properties determined eligible for listing in the NRHP and subject to a protocol agreement signed on January 25, 2001 by the Texas Turnpike Authority (TTA), TxDOT, and the Texas SHPO (THC) that specified mitigation standards for “structural historic properties” adversely affected by the construction of the new roadway. The nominations were presented to the THC and individual property owners who could pursue official listing in the NRHP. The nomination packets and other mitigative documentation materials were subject to approval by the THC and other consulting parties.

Project historians began their work by reviewing information gathered for the original historic resources survey report that resulted in its determination of eligibility. This report stated that the complex was eligible under Criterion C and that the house and outbuildings are representative of patterns of vernacular design and historic regional agricultural trends and was, therefore, eligible for the NRHP under Criterion C. Historians conducted supplemental research of primary and secondary source materials at repositories in Lockhart, Luling, and Austin. Field investigations provided updated photographic documentation of the house and ancillary structures. Historians prepared a National Register nomination and documentation to Historic American Buildings Survey (HABS) standards in compliance with stipulations in the protocol agreement.

STEP 1: REVIEW AND CRITICALLY ASSESS INFORMATION GATHERED DURING RESEARCH AND FIELD INVESTIGATIONS

The E. W. Raney Farmstead is located near the community of Mendoza, north of the town of Lockhart and south of the community of Mustang Ridge, on gently sloping Blackland Prairie agricultural land. The current legal boundaries of the parcel of land encompass 18.33 acres, which are divided into two separate legal parcels, a 15.00-acre agricultural parcel and a 3.33-acre domestic parcel (*Figure 7-12*). During the period of significance from ca. 1915 to ca. 1967, the parcel of land included approximately 180 acres. The farmstead is an early-twentieth-century agricultural complex consisting of a two-story, wood-frame, National Folk pyramidal house with minimal stylistic influences (*Figure 7-13*), as well as a

⁴ Information for this case study was pulled directly from the National Register Nomination prepared by Hicks & Company in 2004 and updated by Hardy-Heck-Moore, Inc. for aci consulting in 2010.

⁵ When the property initially was documented by reconnaissance-level survey efforts in 1999, the property, identified as the Brashears House, was recommended eligible for listing in the NRHP and thus included in the scope of the mitigation project. However, by the time mitigation efforts commenced in 2008, a large-scale addition had been constructed at the rear of the main house, jeopardizing the property’s eligibility, as will be discussed later in this case study.

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collection of associated outbuildings within the domestic and agricultural work zones. These include a storage structure, a secondary residence, two outhouses, three barns, a chicken coop, an egg house, and two water wells (*Figures 7-14 through 7-22*). The surrounding setting remains generally agricultural, although some new residential development is beginning to encroach upon the property.

Historic Context

Located within the Blackland Prairies east of the Balcones Escarpment, the E. W. Raney Farmstead exemplifies an early twentieth-century agricultural property. Cotton dominated the local agricultural-based economy through much of the late nineteenth and early twentieth centuries and remained its foundation until the 1930s, when collapsing prices and over-farming led many farmers to begin raising livestock on the gently rolling prairies. Cotton never regained the prominence and stature it once held, as the irrigated fields in West and South Texas became the state's leading producers. Although many farmers continued to grow cotton, others diversified by planting other kinds of crops or raising livestock.

The E. W. Raney Farmstead was a family-owned yeoman farm that began operations in 1889 when E. W. Raney purchased 183 acres of land from Charles Kelley. Prior to Raney's ownership, the property had been part of a 738-acre tract that changed hands many times. The 1880 census indicates that Kelley was a farmer, but no resources from the Kelley period of ownership are extant on the property, and it is unlikely that Kelley constructed any improvements on this portion of his 738-acre tract.

E. W. Raney constructed the main house and barns on the property after he purchased it in 1889. His agricultural holdings slowly grew, and in 1904 he acquired an additional 136.3 acres. Caldwell County tax maps from both 1917 and 1922 (updated through 1940) show that E. W. Raney owned a combined 313 acres of property that stretched northwest to SH 21 and southwest to Barth Road.

Historically, land in the northern Caldwell County area has supported cotton and corn cultivation and raising livestock such as horses and cattle. It is likely that Raney followed these countywide trends, although research revealed little detail regarding specific agricultural activities on the property during the period of significance. Aerial photos dating from 1966 show that the 15-acre agricultural parcel south of the main house was generally cleared but included some scattered trees and shrubs – a pattern that indicates likely use for livestock grazing (*Figure 7-23*). This aerial photo shows that the adjacent lands—which were also owned by the Raney family at that time—were cultivated for farming.

The Raney family's agricultural operation came to an end in 1967 when Ada Raney, E. W. Raney's widow, divided the land and sold 3.36 acres to William P. Stromberg and 112.87 acres to Rowena Brashears. Ada Raney retained the right to live in the main house on the property until her death. In 1994, William P. Stromberg sold his portion to Rowena Brashears.

Resource Descriptions

General Setting: The E. W. Raney farmstead consists of 18.33 acres – 3.33 acres within the domestic work zone, which includes the main house and associated domestic outbuildings, plus 15 acres of cleared land and barns used for livestock (see *Figure 7-12*). Barbed wire fences run through the

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property, separating most of the buildings from the agricultural land. Within the domestic portion of the property, a decorative metal fence and gate surround the main house to the northeast and southeast. An unpaved trail leads from the domestic parcel to the south through the associated agricultural land, and a series of large stock ponds is located at the center of the agricultural property. The main house sits in the middle of the domestic parcel, oriented to the northeast toward Williamson Road. The domestic parcel also includes outbuildings closely related to domestic life. The outhouse is located directly behind the house to the southwest. The chicken coop and the egg house are located behind and to the west of the main house. The storage structure is located further to the southwest. Two wells are located to the southeast of the main house.

The adjacent agricultural land wraps around the domestic cluster in an L-shape. The two main barn/stable buildings straddle a fence line that separates the domestic properties from the adjacent agricultural land. In fact, circulation between the domestic parcel and the agricultural parcel is provided through the interior of the main barn. The largest barn/stable is located southwest of the house, and the secondary barn is located due south of the main house. A third, smaller barn is located deeper within the agricultural land, southwest of the larger barns.

Main House: The main house on the E. W. Raney property faces northeast toward Williamson Road (see *Figure 7-12*). As originally designed and constructed, it is a ca. 1915 one-and-a-half story National Folk house with a pyramidal roof form and with minimal amounts of stylistic architectural detailing (see *Figure 7-13*). The wood-frame house is supported on a pier-and-beam foundation. The footprint of the original portion of the house is nearly square in shape, four bays wide and four bays deep, surmounted by a pyramidal roof. Large dormers with hipped roofs project from each of the four sides of the pyramidal roof. On the interior, the original portion of the house has a center-passage plan. The house is faced with weatherboard siding, and the roof is sheathed in composition shingles. A wraparound porch is recessed under the pyramidal roof form on the northeast and southeast façades. The original windows are one-over-one, wood-sash, some of which have a lattice detail at the upper sash. Some of the windows have been replaced with aluminum-sash units. On the northwest façade, one of the window openings has been enlarged to accommodate new double doors. At the dormers, most of the window openings have been enlarged, and the original windows have been replaced with four-over-four, vinyl-sash windows, although an original one-over-one, wood-sash window remains intact at the southwest façade.

There have been a series of additions to the house that post-date the period of significance. A one-story sunroom with one-over-one wood windows on three sides and a shed roof form was added to the original southwest façade ca. 1940 (*Figure 7-24*). A one-story restroom addition with a side-gabled roof form was constructed at the northwest façade ca. 1960 (*Figure 7-25*). In early 2008, a substantial one-story rear addition with an irregular hipped and gabled roof form was constructed at the southwest façade, connecting the addition to the main house at the sunroom (*Figures 7-26 and 7-27*). The rear addition is constructed with a wood frame and clad in vinyl siding, with vinyl windows and doors. The

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footprint of the rear addition is similar in size to the footprint of the original house and overwhelms the original house's form and relationship to the associated outbuildings and landscape to the southwest.

Main Barn/Stable: The main barn/stable is located just along the northeastern fence line outside the domestic cluster (see *Figure 7-12*). The barn is oriented toward the northeast, and its form conveys many of the qualities of the main house. It is one-and-a-half stories in height, five bays wide and nine bays deep, with a hipped roof (see *Figure 7-14*). A large dormer projects from the roof at the northeastern façade, accommodating a hay loft on the interior. The barn/stable is constructed with a wood frame, and the roof and walls are clad in corrugated metal siding. The form, materials, and construction methods suggest that the barn was constructed ca. 1915. At the center of the northwest façade, access to the interior is provided through a sliding, hasp-hung door. Access to the hay loft is provided through a pair of hinged doors. At the southeast and southwest façades, the barn/stable is open to the air, so that the building is accessible to livestock. A series of slatted wood fences subdivide the interior space of the barn/stable and enclose a corral off the southwest façade. As a result, the barn is a hybrid of the side-entry and transverse types commonly found in Central Texas. Other than routine maintenance, the barn has not experienced any alterations, and its integrity of location, design, materials, and workmanship is intact.

Barn: The secondary barn is located due south of the main house, straddling the fence line between the agricultural and domestic work zones (see *Figure 7-12*). The barn has a roughly square footprint, five bays wide and five bays deep, and is oriented toward the northwest. The form of the building is one-and-a-half stories in height, with a hipped roof (*Figure 7-15*). The structure of the building is wood-frame, the walls are clad in unfinished weatherboard, and the roof is clad in corrugated metal. The form, materials, and construction methods suggest that the barn was constructed ca. 1915. The center bay of the building is an open galley, resembling a dog-trot plan. Hinged doors open onto the other bays at the northwest façade. The southwestern section of the interior has a poured concrete floor, with "E.W. Raney" stamped in the concrete. An open canopy that shelters livestock projects off the southwestern façade, following the side-entry barn type. The porch has a shed roof supported by raw cedar posts.

Barn: The third barn is located farther from Williamson Road, southwest of the main house and the other barns (see *Figure 7-12*). The barn is oriented toward the southwest, away from the main house. The barn has a three-room linear plan, three bays wide and one bay deep, and a steeply pitched, side-gabled roof. The structure is wood frame, the exterior walls are clad in unfinished weatherboard patched in areas with corrugated metal, and the roof is clad in corrugated metal. Along the southwestern façade, the roof form continues beyond the exterior wall to create a front canopy, in accord with the side-entry barn type. The canopy roof is supported by short cedar posts—approximately four feet tall—and the roof plane nearly reaches the ground and provides deep shade to shelter livestock (see *Figure 7-16*). The form, materials, and construction methods suggest that the barn was constructed ca. 1900. The form of the barn resembles National Folk houses constructed in the area in the 1890s, and it is possible that the building once served as a dwelling, or that the construction materials were salvaged from a residential building.

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Chicken Coop: The chicken coop is located west of the main house and oriented toward the southeast (see *Figure 7-12*). The building has been constructed ad hoc, using a variety of salvaged building materials. As a result, the form of the building is irregular, and it is difficult to estimate when additions were constructed or alterations were executed. The original portion of the building was constructed ca. 1915 and has a one-story narrow linear form, roughly six bays wide and one bay deep, with a shed roof. A rear addition was constructed ca. 1940, so that today the building has a side-gabled appearance (see *Figure 7-17*). The building is constructed with a wood frame and clad in several different types of metal siding. The southeast and northwest façades are partially open to the air for ventilation, enclosed only with wire mesh, which is typical of the chicken coop building type.

Storage Structure: The storage structure is located southwest of the main house and oriented toward the southwest (see *Figure 7-12*). The one-story structure is constructed with a wood frame, two bays wide and two bays deep, and has a front-gabled roof. The roof is clad in corrugated metal, as are the northwestern and northeastern façades. The southwestern and southeastern façades are open to the air, so that the structure resembles a carport (see *Figure 7-18*). However, because the structure is oriented toward the agricultural land, its historic function was likely as a work shed used to store agricultural equipment. Its estimated date of construction is ca. 1930, after mechanical agricultural equipment became widely available in the area.

Outhouse: The outhouse, located directly behind the main house to the southwest is a one-story, one-room, wood-frame building with a side-gabled roof (see *Figure 7-19*). The building is clad in wood weatherboard with a corrugated metal roof. A hinged door on the southeast façade opens onto the interior space. The side façades are marked by decorative diamond-shaped vents. The outhouse is located directly behind the main house (see *Figure 7-12*).

Egg House: The egg house is a short, one-room building with a front-gabled roof located near the chicken coop and oriented to the southeast (see *Figures 7-12* and *7-20*). Historically, the egg house was located immediately behind the main house, but it was moved in 2008 to accommodate the rear addition to the main house. The building is constructed with a wood frame. The walls are clad in weatherboard and painted white, and the roof is clad in corrugated metal. The building was damaged when it was relocated, and the siding is falling off the wood frame.

Water Wells: The water wells are located southeast of the main house, immediately northeast of the secondary barn (see *Figure 7-12*). The first well is a cylindrical brick structure covered in cement stucco, constructed ca. 1915 (see *Figure 7-21*). It is covered with a metal and concrete cap. A metal support structure to hold a water bucket extends upward from the base of the well. The second well is a smaller square brick structure covered in cement stucco, also constructed ca. 1915 (see *Figure 7-22*). It is topped with a sheet metal cap. The concrete stucco is not original, although the wells probably originally were covered in a lime-based stucco.

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Relevant Questions to Guide Analysis of Information Obtained During Research and Field Investigations

Many of the questions posed in the evaluation guidelines are not applicable to this property and investigations; however, relevant questions are restated in italics and are followed by responses.

- *Does the historic context provide the framework for understanding the events, patterns, and themes that are directly associated with the recorded agricultural properties?*
Yes, the context clearly associates the property with the theme of agricultural development in Central Texas.
- *What are the broad agricultural and land-use patterns observed during field investigations, and are they consistent with what the research design implied or suggested?*
The land-use patterns observed during fieldwork include a domestic work zone within a fenced cluster, and adjacent agricultural work zone, land used for livestock grazing to the south, and cultivated farmland to the north/northwest (outside the current legal boundaries of the property). These broad land use patterns are similar to those observed in historic aerial photos.
- *What historical factors may have affected the kinds of buildings that are present, the use or functions of these resources, or the way agricultural land-use patterns shifted and changed over time?*
The historical use of the property for livestock grazing influenced the form and location of the multiple barns on the property, which all open onto the grazing land and include stalls for livestock. Also, general patterns of family subsistence during the early twentieth century influenced the presence of outbuildings within the domestic work zone, such as the chicken coop and egg house. The land-use patterns were impacted significantly in 1967, when the 112.87 acres that had been used as farmland were partitioned from the Raney farmstead and sold. The character of this partitioned parcel subsequently was altered by the construction of a large stock pond sometime between 1966 and 1975.
- *How prevalent are new buildings and structure within the APE and study area? What impact have they had on the historic landscape?*
Although no new buildings have been constructed, the large addition on the rear of the main house is quite prominent and visible from the right-of-way of SH 130, overwhelming the historic main house and detracting from the overall historic character of the farmstead. With the exception of the construction of SH 130, the area surrounding the property has largely remained rural since the period of significance.
- *How prevalent are vacant buildings? Have unoccupied/unused buildings been converted to new uses, or are they abandoned and in varying states of deterioration or disrepair? Does their current appearance still convey information about their previous functions?*
The only vacant/abandoned building is the storage structure, which is overgrown and structurally unsound. However, it is discretely located in a back corner of the domestic work zone, so that it has little visual impact on the overall character of the farmstead.

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- *Did these changes to properties and within landscapes occur prior to the survey cut-off date?*
The major changes to the property—the partitioning of the farmland, the construction of the large stock pond, and the large rear addition to the main house—all occurred after the survey cut-off date.
- *What do research and field investigations suggest may be the basis for defining the period of significance in the study area?*
The beginning of the period of significance is tied to the construction of the main house ca. 1915, and the end is defined by the sale of the 112 acres of associated farmland in 1967.

STEP 2: ASSESS SIGNIFICANCE UNDER THE NATIONAL REGISTER CRITERIA FOR EVALUATION AND CRITERIA CONSIDERATIONS

Criterion A⁶

This property is closely associated with agricultural practices and production in Caldwell County from the late nineteenth and early twentieth centuries. The parcel includes the remnants of a historic family-owned yeoman farm dating to the early twentieth century. Contextual research indicates that the farm was established around 1889 by E. W. Raney, whose family ranched and farmed the land until 1967, when it was subdivided and sold. Until 1967, the farm encompassed 313 acres, and corn and cotton were likely the primary crops grown. In addition, historic aerial photos suggest that horses and cattle were raised as livestock. These trends were common throughout areas along or east of the Balcones Escarpment.

This farm reflects the strong agricultural traditions that provided the foundations of the local economy of the period. However, because the majority of the associated farmland was sold off in 1967, the property no longer is able to communicate these associations. The remaining 18-acre parcel includes land that, at least in recent years, has been associated with livestock raising in the Blackland Prairie region of Caldwell County. The severance of the land historically associated with the property diminishes its overall significance and negatively affects its integrity.⁷ Therefore, it is not eligible under Criterion A for its association with important events, trends, or themes in the area of agriculture.

- *What period does the property represent, and was this era important in local agricultural history?*
The current 18-acre parcel reflects only livestock raising. The land that was used for farming was sold off in 1967, severing the property's link to the important historic trend of farming in the Blackland Prairie area of Central Texas in the early twentieth century.
- *Are agricultural and land-use patterns significant at a local, state, or national level?*
No, the property no longer retains most of the land historically associated with its agricultural operations during the early and mid-twentieth century.

⁶ Note that the scope of work for the NRHP evaluation completed in 2008 included only evaluation under Criterion C, not Criterion A or B.

⁷ This is further discussed in *Step 6: Identify Integrity Thresholds for NRHP*.

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- *Is the property an example of a historic farm, ranch, or dairy farm that serves to illustrate agricultural activities over time? Is it noteworthy and, if so, why?*
No, the current 18-acre parcel includes buildings, structures, and land-use patterns suggest historical agricultural operations but it lacks sufficient context to possess significance with the past.
- *Does the property derive significance because of its association with innovative agricultural practices, techniques or procedures?*
No, the agricultural complex is not known to be associated with any innovative or noteworthy agricultural practices, techniques, or procedures.
- *Does the property derive significance because the type(s) of crops cultivated on the land marked a departure from previous agricultural practices and introduced a new product to the area or region?*
No, the property does not possess such significance because most of the land historically used to grow crops is no longer associated with the 18-acre parcel that includes the main house and associated outbuildings.
- *Does the agricultural property possess significance when evaluated from the perspective of the historic context? Does that significance stem from the collection of buildings and land-use patterns that reflect important agricultural patterns from the past?*
The agricultural buildings and land-use patterns extant today are associated only with livestock raising and lacks significance with historical agricultural pattern.
- *Does the property derive significance because it was used to develop or improve distinctive breeds of livestock, etc.?*
Research did not reveal any connection between the property and the development or improvement of distinctive breeds of livestock.
- *Is the property a good local example of agricultural practices associated with an ethnic or cultural group, and does it retain the qualities that demonstrate the distinctive agricultural practices of that group?*
The agricultural complex is associated with Anglo-American agricultural practices, which prevailed throughout most of the Central Texas region.
- *Does the property derive significance because it is an early or noteworthy example of the effects of a government-sponsored program that changed or influenced agricultural patterns?*
The agricultural complex is not known to be associated with any government-sponsored programs.

Criterion B⁸

The E. W. Raney family does not appear to have made any significant historical contributions at the local, state, or national level. Therefore, the property does not meet Criterion B.

⁸ Note that the scope of work for the NRHP evaluation completed in 2008 included only evaluation under Criterion C, not Criterion A or B.

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- *What are the contributions of the individual and how did they encourage, improve, or support agricultural activities?*
Research did not reveal any noteworthy agriculture-related contributions of E. W. Raney that would make him significant within local, state, or national history.
- *Why is the individual significant in history; are there other properties that are a better illustration of that individual's significance?*
Although no other known properties are associated with E. W. Raney, he was not known to be a historically significant individual.
- *Did the person invent important agricultural machinery?*
Research did not reveal that E. W. Raney invented any important agricultural machinery.
- *Did the person develop new strains of specific crops?*
Research did not reveal that E. W. Raney developed any new strains of specific crops.
- *Was the person a leader in agricultural organizations?*
E. W. Raney was not known to be associated with any agricultural organizations.
- *Did the individual attain significance for contributions made to the cultivation, harvesting, or production of crops?*
E. W. Raney did not make any known contributions to the cultivation, harvesting, or production of crops.
- *Did the person embrace new technologies or practices that improved the quality of livestock or increase the profitability, marketing, or distribution of livestock and related by-products?*
Research did not reveal that E. W. Raney was involved in new technologies or practices that improved the quality of livestock and related by-products.
- *Did the individual contribute to efforts to expand dairy operations and its profitability through innovative means?*
Research did not reveal that E. W. Raney was involved in dairy operations.
- *What is the association of the property with an important agriculturist?*
There is no known association of the property with an important agriculturist.

Criterion C

The E. W. Raney Farmstead includes a domestic work zone and an agricultural work zone where most of the property's distinctive buildings and physical features are concentrated. The main house, the focal point of the domestic work zone, reflects a common early twentieth century domestic architectural form that was popular in the immediate area and throughout much of the state. Likewise, the agricultural work zone contains several barns that are illustrative of the kind of ancillary buildings built on early twentieth century farms in the region. Although these examples are not necessarily rare within the region, they possessed significance under National Register Criterion C in the area of architecture at the local level of significance at the time they were documented for the SH 130 study.

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- *Is any building significant because it displays noteworthy craftsmanship in its construction or embellishment?*

The main house exhibits detailing that typifies a distinctive and popular domestic form that was common in the region during the first quarter of the twentieth century. Although most of its materials and embellishments are machine-made, the building featured noteworthy craftsmanship in its construction that is no longer evident in modern residential construction.

- *Do the buildings exemplify methods of construction that are common or unusual within the APE and study area?*

The methods of construction for all buildings were typical for the study area at the time.

- *Are any buildings unique or rare examples of a building type or form? Is it common in the surrounding region, and does it reflect vernacular or folk traditions of an ethnic group or culture?*

Although the main house is a good example of pyramidal hip-roofed house, it is not rare; another similar example is on the other (east) side of Williamson Road. The associated barns are especially good examples of vernacular building traditions and barn types within the region. Within the study area for the SH 130 project, they are exceptional; no other barns of this size or complexity were identified, while this property features three clustered together.

- *Does any building represent an intact example of its kind from a particular time in history? What makes it significant for that reason?*

Yes, the main house and barns are examples of recognized styles and property types. Although numerous other examples of pyramidal-roofed houses remain intact in the area, few examples of these barn types remain in as good and intact state, which makes them significant at a local level.

- *Is it noteworthy because it embodies the assimilation of a distinctive group into the dominant culture or society in surrounding areas?*

The resources are not noteworthy for the assimilation of a distinctive group into the dominant culture in surrounding areas.

STEP 3: DEFINE PERIOD OF SIGNIFICANCE

The beginning of the period of significance is tied to the construction of the main house ca. 1915, and the end is defined by the sale of the 112 acres of associated farmland in 1967.

STEP 4: ANALYZE THE ASPECTS OF INTEGRITY

Location

Most resources on the property remain in their original location, with the exception of the egg house. The egg house is a relatively small resource that was moved to a similar site within the domestic work zone. Therefore, the farmstead's integrity of location remains generally intact for both the domestic and agricultural work zones.

Design

The vast majority of buildings, structures, and landscape features have experienced no alterations to their original design. However, the design of the main house has been subject to significant alterations. Cumulatively, the alteration of the original fenestration pattern and the significant additions destroy the main house's integrity of design. This, combined with the relocation of the chicken coop, compromises the overall design of the domestic work zone. Furthermore, although the design of the agricultural work zone and the buildings contained within remain intact, the historically associated farmland has been partitioned and sold so that the historic design of the farm and its use of land no longer exists and, therefore, lacks integrity. Because both the domestic work zone and the associated agricultural lands lack integrity of design, the property as a whole lacks integrity of design.

- *Are alterations more severe on the main building? How does that affect integrity of design to the property as a whole?*

The most severe alterations are on the main house, which is the most prominent resource when the property is viewed from the public right-of-way. The number and scale of these alterations compromise the integrity of design of the domestic work zone as a whole, although the integrity of design of the agricultural work zone remains intact.

- *If alterations are more pronounced and extensive to associated outbuildings, what is the combined effect on these changes to the property as a whole?*

Outbuildings have experienced no alterations to their original design.

- *Has the construction of non-historic buildings altered the spatial relationships among the historic buildings; how have they affected agricultural activities?*

No non-historic buildings have been constructed on the property.

- *Has the functional organization of the property changed?*

The partitioning of the associated farmland has changed the functional organization of the property, which compromises its integrity of design.

Setting

The setting within the domestic work zone and the agricultural work zone, along with the land immediate around the farmstead retains much of its historic rural character. Vegetation patterns remain generally the same on the historically associated landscape, with scattered vegetation on lands historically used for grazing and active cultivation of lands historically used for farming. New residential development has occurred nearby, but it is not visible from the property and does not interrupt views toward the property from the right-of-way. The only significant changes to the setting are the construction of SH 130 east of the property and the construction of a large stock pond on the adjacent, historically associated farmland. Despite these changes, the setting surrounding the property has largely remained rural since the period of significance. Therefore, the E. W. Raney farmstead retains its integrity of setting.

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- *Does the overall landscape of the agricultural property retain the qualities that make it significant for its historical associations?*
Yes, the overall landscape still reflects the historic land-use patterns, with land south of the main house used for livestock grazing and land north of the main house used for farming.
- *Do the landscaping and plantings within the domestic work zone represent important elements that distinguish this cluster from other parts of the property?*
Yes, the domestic work zone includes a grass lawn surrounded by a decorative metal fence that differentiates it from the surrounding agricultural land.
- *Have historic circulation patterns remained sufficiently intact over time to remain recognizable on the landscape?*
Yes, historic circulation patterns remain intact.
- *Did landscape changes contribute to agricultural operations on the property and are they important to its significance?*
Yes, the surrounding land contributed to these operations; however, the partitioning of the associated 112 acres of farmland significantly changed the ability to conduct the kind of agriculture-related activities (farming) historically associated with the property.
- *What are the effects of underground pipelines, power transmission lines, and communication towers to an agricultural property?*
Power transmission lines located southwest of the property interfere with the views between the property and the surrounding rural setting.
- *How has encroachment from development on adjoining properties affected the ability of the property to present its sense of the past?*
With the exception of the construction of SH 130 east of the property and small pockets of residential development on nearby properties, the surrounding setting remains predominantly rural.
- *Has the land been manipulated with contouring, etc., to improve farming or control erosion? Did that work occur during the period of significance?*
The land within the existing parcel does not show any signs of manipulation for erosion control or to improve farming.

Materials

Alterations affecting the integrity of materials of the extant buildings are largely confined to the domestic work zone and include the replacement of some windows on the main house and the replacement of materials over time on the chicken coop. The construction of a large rear addition onto the main house introduces a new set of materials that are not consistent with the property's overall historic character. The integrity of materials within the agricultural work zone remains intact, and despite the few alterations within the domestic work zone, the overall property largely retains its integrity of materials.

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- *Is the alteration a response to changing conditions and related to agriculture?*
The new windows on the main house likely stem from deterioration; however, the use of a different type of siding on the chicken coop has been essential to its ongoing agricultural use.
- *Does the introduction of materials that do not date to the period of significance detract from the historic character of the property to such an extent that it no longer contributes to the significance of the property?*
The introduction of non-historic materials does not overwhelm the historic character of the property but they certainly diminish its overall historic character, especially with those on the addition onto the main house.

Workmanship

Architectural details that express workmanship on the main house remain intact, as do elements in the barns such as raw cedar posts and concrete stamped with “E.W. Raney.” As such, integrity of workmanship appears to be mostly intact for both the domestic work zone and the agricultural work zone.

- *Do the buildings and structures display noteworthy detailing in their construction, finish, or embellishment?*
Yes, the detailing and craftsmanship of the main house is noteworthy, as are the construction details present in the barns.
- *Is the craftsmanship indicative of a particular ethnic group and does it retain the physical traits that made that association evident?*
The craftsmanship of the main house and associated outbuildings is not indicative of a particular ethnic group.
- *Have distinctive physical features been covered, replaced, or removed?*
Distinctive physical features displaying workmanship remain largely intact but the replacement windows of the main house detract from the building’s integrity of workmanship.
- *Are these changes and alterations easily reversible and how do they diminish from the property’s historic character?*
Most of the changes are relatively small in scale and are reversible; however, they negatively affect the property’s overall integrity of workmanship.

Feeling

Although the property is still recognizable to the period when it achieved significance and conveys a sense of its historic use as an agricultural property from the early twentieth century, alterations to the main house within the domestic work zone, and the loss of the associated farmland compromise its integrity of feeling.

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- *Does the main building within an agricultural complex fall within the established period of significance? If so, does it still convey its integrity of design, materials, and workmanship?*
Although the main house was constructed during the period of significance, it lacks integrity of design and materials due to changes to the fenestration pattern, replacement of windows, and construction of multiple additions.
- *What is the combined effect of alterations, post-dating the period of significance, to the main building and associated outbuildings?*
The combined effect of alterations to the main house and the loss of the historically associated farmland alter the feeling of the property.
- *How have changes to the land and land use altered the historic character of the property and would a person from the period of significance still recognize the property from his or her association with the property?*
Yes, a person from the period of significance still would recognize the property.
- *How has the introduction of new buildings and structures affected the historic qualities of the domestic and agricultural work zones and the associated landscape?*
No new buildings have been constructed.
- *Is the remaining acreage of land large enough to convey major agricultural functions?*
The remaining 18.33 acres of land are not sufficient to represent the historic agricultural activities that occurred during the period of significance, when the property measured 180 acres. Historically, the property was used for a large farming operation, as well as a small livestock operation. Only the small livestock operation is encompassed by today's legal boundaries.
- *Is the complex still in use or has it been abandoned?*
The complex remains occupied but not in agricultural use today.
- *How has the setting of the surrounding area changed? Have these changes affected the spatial relationship of the agricultural complex to other resources?*
With the exception of the construction of SH 130 east of the property, the construction of a large stock pond on adjacent farmland historically associated with the property, and the construction of new residential developments and power transmission lines nearby, the overall setting surrounding the property has remained largely rural since the period of significance.
- *Is there still a distinct delineation between domestic and agricultural spaces? How has the relocation of buildings affected this delineation?*
Yes, the fences delineating the domestic and agricultural spaces remain intact. The egg house was relocated in 2008 to accommodate the construction of an addition on the main house; however, it is still located within the fenced boundaries of the domestic zone.
- *Are there cultural techniques still reflected in the property?*
Cultural techniques were not historically relevant to this property.

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Association

Since the farmland historically associated with the E. W. Raney Farmstead was portioned off and sold, the property's association with farming no longer retains integrity.

- *Is the property still functioning as an agricultural property?*
Although horses are still raised on the property, no farming occurs today.
- *Do ongoing agricultural operations date to the period of significance? How have they changed over time?*
Livestock raising occurred during the period of significance, as it does today. However, during the period of significance, farming was the primary agricultural activity on the farmstead, and no farming occurs today.
- *How do changes in land use and agriculture-related patterns and activities contribute to or detract from the property's overall historic character?*
The lack of active farming detracts from the property's integrity of association.
- *How has the associated acreage changed over time, and how does this affect the land-use patterns and ability of the property to convey its agricultural use?*
During the period of significance, the property encompassed 180 acres, but it only includes 18.33 acres today. The remaining acreage is not sufficient to illustrate the breadth of agricultural activities that historically occurred on the property, which included both livestock raising and farming.
- *Do the extant historic-age resources reflect the agricultural use of the property during its period of significance?*
The extant barns appear to have been designed to accommodate livestock and they still are used in that capacity.

STEP 5: ANALYZE THE CHARACTERISTICS OF A RURAL HISTORIC LANDSCAPE

Note that the analyses set forth in Step 4 and Step 6 conclude that the domestic zone and the associated agricultural fields lack integrity under Criterion A, B, or C, and therefore, the property is not eligible for listing in the NRHP. Nonetheless, the characteristics of a rural historic landscape are analyzed below in order to provide guidance for evaluating similar properties that do retain integrity.

Land Use and Activities

Historic aerial photographs document that the land south of the main house was used for livestock, while the land north and west of the main house was used for farming. Current aerial photographs indicate that these land-use patterns remain intact (*Figure 7-27*). However, the adjacent farmland was partitioned off and sold in 1967, so that it no longer is associated with the E. W. Raney Farmstead.

Patterns of Spatial Organization

Patterns of spatial organization historically were delineated by fences, including barbed wire fences surrounding the agricultural work zone and separating livestock grazing areas from farmed fields and a decorative metal fence separating the domestic work zone from the agricultural work zone. These fences remain intact in their historic locations today. Furthermore, current aerial photographs show that the property's spatial organization has not been interrupted by the introduction of new buildings, roads, or boundaries (see *Figure 7-27*).

Response to the Natural Environment

Historically, the property responded to the natural environment by taking advantage of the rich soils of the Blackland Prairie for farming. However, today the land used for farming no longer is under different ownership.

Cultural Traditions

The architectural styles, construction techniques, and land-use patterns displayed on the property are associated with nationally popular trends disseminated by the railroad rather than distinct ethnic or cultural traditions.

Circulation Networks⁹

Today, a network of dirt roads connects the agricultural work zone to the land used for livestock grazing (see *Figure 7-27*). Because of the poor quality of historic aerial photographs, it is difficult to discern whether these circulation patterns have changed over time. Also, during the historic period, circulation routes that connected the adjacent farmland to the agricultural work zone would have been necessary for the property's operation. No such circulation is visible today. It is likely that these roads fell out of use after the adjacent farm land was sold off in 1967, allowing vegetation growth that has obscured them.

Boundary Demarcations

As described above, a series of fences separates different land use areas. However, the legal boundaries of the property are not demarked in a way that is easy to discern from the ground.

Vegetation Related to Land Use

On the land used for livestock grazing, vegetation growth is maintained and limited to small trees, shrubs, and grasses, all of which accommodate livestock. Crops continue to be grown on the land formerly associated with the property. Although the land is used for farming, it now is under different ownership.

⁹ USGS topographic maps can be used to determine circulation patterns as they often show fence lines and driveways.

Buildings, Structures, and Objects

The buildings and structures present on the property reflect their historic agricultural use. The buildings in the domestic work zone—such as the chicken coop and egg house—are a tangible link to an era when farmers were largely self-sufficient, raising much of their own food on the farm as possible. The buildings in the agricultural work zone—especially the barns—display building forms that reflect the property’s historic use for farming and livestock raising.

Clusters

Domestic buildings and agricultural buildings each are clustered together in distinct work zones that are separated by fences, as is typical of agricultural properties of the era. They are clearly discernible features of the agricultural landscape.

Archeological Sites

For the purposes of this study, archeological sites are not part of the evaluation process.

Small-Scale Elements

Historic small-scale elements, such as wells, that were vital to the historic function of the farmstead remain intact today; however, they represent a minor aspect of the historic landscape.

STEP 6: IDENTIFY INTEGRITY THRESHOLDS FOR NRHP ELIGIBILITY

Eligibility under Criterion A

The Raney farmstead retains a high degree of integrity in the areas of location and setting and sufficient integrity in the areas of materials and workmanship. However, due to the loss of the associated lands, the remaining acreage is not large enough to convey the major agricultural functions of the property, which are set forth as significant in the historic context. In addition, the property does not retain a sufficient amount of integrity in the area of design, due to the multiple alterations to the main house and the loss of historic farmlands. Furthermore, the property no longer retains integrity of feeling as it can no longer convey a sense of the time and place from when it achieved significance due to the combined effect of changes to the main house and the loss of associated agricultural land. Consequently, although the property has significance, it lacks sufficient integrity to be eligible under Criterion A.

Eligibility under Criterion B

Although the farm was the home of the patriarch of the Raney family, who settled in the area in the late nineteenth century, the resource does not derive significance for that association. Therefore, it does not meet Criterion B.

Eligibility under Criterion C

As discussed in Step 2, the property possesses significance under Criterion C in the area of architecture because the main house, located within the domestic work zone, and the barns, located within the

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agricultural work zone, typify the kind of agricultural property that once prevailed in the area during the early twentieth century. However, the combined effect of the recently completed changes to the main house, the removal of a historic-age rear wing, and the construction of a large addition that is visible from public right-of-way are so severe that physical qualities that made the grouping important has been compromised. The property no longer retains sufficient integrity of design, materials, workmanship, and feeling to convey its significance under Criterion C.

STEP 7: DETERMINE AND JUSTIFY PROPERTY BOUNDARIES

Since the property lacks sufficient integrity to meet any of the National Register Criteria, determination of NRHP boundaries is irrelevant. However, if the property did retain integrity, justifiable property boundaries would be the legal property boundaries during the period of significance.

STEP 8: CLASSIFY RESOURCES AS CONTRIBUTING AND NONCONTRIBUTING ELEMENTS

In this instance, the property as a whole lacks integrity. However, if the property retained integrity, as initially determined by TxDOT, contributing and noncontributing resources would be defined as set forth below.

Contributing Resources

Contributing resources are those resources that were constructed within the period of significance and retain their physical integrity. On the E. W. Raney Farmstead, those resources include:

- Barn (*Figure 7-14*)
- Barn/stable (*Figure 7-15*)
- Barn (*Figure 7-16*)
- Chicken coop (*Figure 7-17*)
- Outhouse (*Figure 7-19*)
- Egg house (*Figure 7-20*)
- Well (*Figure 7-21*)
- Well (*Figure 7-22*)

Noncontributing Resources

Noncontributing resources are those resources that were constructed outside the period of significance and/or those resources that lack physical integrity. These include:

- Main house (*Figure 7-13*)
- Storage structure (*Figure 7-18*)

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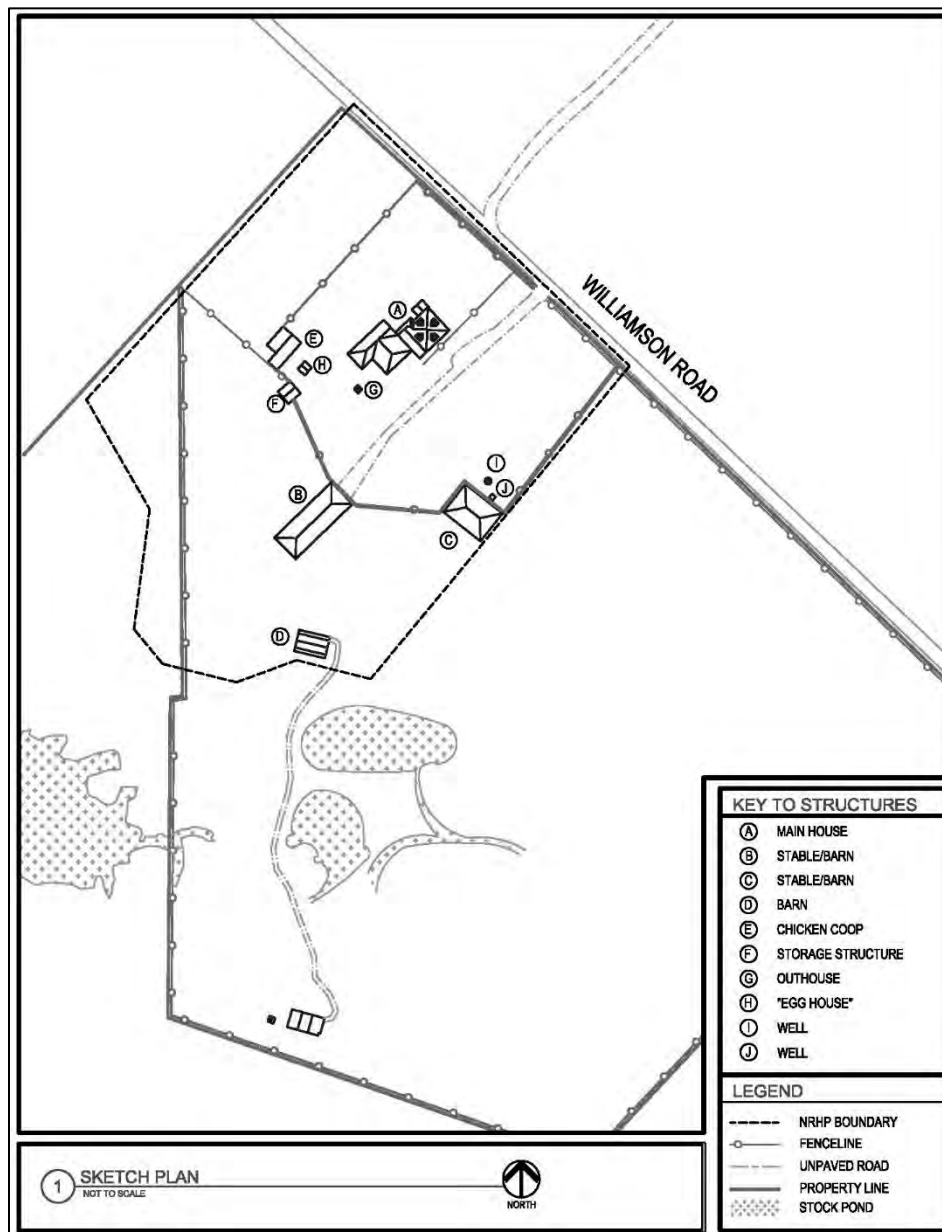


Figure 7-12. Sketch plan of property based on field survey by HHM.

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Figure 7-13. Main house (ID a).



Figure 7-14. Barn (ID b).



Figure 7-15. Barn/stable (ID c).



Figure 7-16. Barn (ID d).



Figure 7-17. Chicken coop (ID e).



Figure 7-18. Storage structure (ID f).



Figure 7-19. Outhouse (ID g).



Figure 7-20. Egg house (ID h).



Figure 7-21. Well (ID i).



Figure 7-22. Well (ID j).



*Figure 7-23. Historic aerial photo from 1966, showing the general location of the E.W. Raney Farmstead in red.
(Source: TelAll Corporation.)*



Figure 7-24. Sunroom addition on southwest façade of main house (ID a), constructed ca. 1940.



Figure 7-25. Photo of northwest façade of main house (ID a), showing restroom addition constructed ca. 1960 at the middle of the original façade and rear addition constructed in 2008 at the rear of the original façade.



Figure 7-26. Rear addition, constructed in 2008.



Figure 7-27. Current aerial photograph. (Source: Google Earth.)

CASE STUDY 3: INTENSIVE-LEVEL SURVEY WITH NO RIGHT-OF-ENTRY

Final Historic Resources Survey Report 183A Toll: From Ranch-to-Market Road 620 to Three Miles North of the Leander, Texas, City Limits, Williamson County, Work Authorization 578 06 SH002, March 2010

Magill Property¹⁰

Project Background

This case study evaluates an agricultural complex that was identified for TxDOT as part of a re-evaluation of a previously completed historic resources survey along 183A Toll in Williamson County. TxDOT funded the re-evaluation study to apply survey methods and guidelines that TxDOT developed and implemented following the original 183A Toll survey in 1998. The re-evaluation project demonstrated how TxDOT's new guidelines and policies can be used to identify, document, and assess historic properties in a more effective and efficient manner. Moreover, the need for such methods are particularly important for design/build projects—as was applicable for the construction of 183A Toll—that typically compress the schedule for a roadway project.

TxDOT tasked historians to conduct the survey using the same 1,300-foot APE along the existing path of 183A Toll, examining the area as if the roadway did not exist. Through the use of GIS map analysis consistent with methods described in these guidelines, the project historians identified 15 properties with historic-age (pre-1956) resources that had not been documented in the previous 1998 historic resources survey. The project historians undertook field and research and identified three properties that exhibited some qualities and attributes worthy of intensive-level investigations. These three properties contained resources that existed in 1962 when USGS published detailed quad maps that extended into the study area. The project historians used Google Maps and Bing Maps to examine existing physical features of the extant buildings on the project and characteristics of the associated lands. Bird's eye view of these three properties showed primary buildings with footprints, roof plans, exterior stone chimneys, and groupings of associated outbuildings that appeared to be relatively intact and appeared to date to the late nineteenth or early twentieth centuries. The following discussion examines the processes used to document and assess Resource No. 6, which historic research identified as being associated with the Magill family.

STEP 1: REVIEW AND CRITICALLY ASSESS INFORMATION GATHERED DURING RESEARCH AND FIELD INVESTIGATIONS

Project historians were not granted right-of-entry to this property, and thus, did not have the opportunity to conduct field investigations of the property. Instead, the project historians had to resort to more indirect means of obtaining information about the property and its physical characteristics. This analysis relied on historic and current map and aerial photograph analysis, as well as in-depth research

¹⁰ Information for this case study was pulled directly from the following report: Hardy-Heck-Moore, Inc., "Intensive-level Investigations of Select Parcels along 183A Toll, Resource ID No. 6." Williamson and Travis Counties, Texas. November 13, 2009.

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of primary and secondary source materials. Based on observations from current aerial imagery available online, the Magill property includes a main house, several outbuildings, and associated agricultural land. The parcel encompasses approximately 85.7 acres; however, the main house and ancillary buildings are not visible from any public right-of-way. These buildings are grouped together on a high point that overlooks most of the associated land and are screened by a dense grouping of juniper trees. Located northwest of the historic part of Leander, the complex is on the east side of 183A Toll. The parcel lies between the North Fork of Brushy Creek and the South San Gabriel River (*Figures 7-28 and 7-29*). Its geographic location places it at the meeting of an alluvial valley along Brushy Creek and the higher ground overlooking the valley. The area surrounding the complex is mostly rural, but is in transition with encroaching residential, commercial, and industrial development.

General Historic Context

The historic context developed for the historic resources survey report examined the historical trends, events, and themes that influenced the development of land within the 1,300-foot APE. The context examined early settlement patterns and documented the importance of ranching and crop cultivation as the basis for the local agriculture-based economy. Many of the early settlers raised cattle and sheep, especially in the more rugged parts of the study area. Along waterways and drainages, other settlers cultivated a variety of crops. For much of the nineteenth century, the farmers grew crops for their own needs but an expanding rail network, increased trade, and a growing population contributed to increased acreage being devoted to cotton.

The western part of Williamson County, which includes the entire study area for the 183A Toll survey re-evaluation, exhibited agricultural trends common to other counties in the region that included land west of the Balcones Escarpment. The rugged land supported agricultural activities but lacked sufficient natural and water resources to sustain large populations. Ranching remained a popular livelihood throughout much of the region during the twentieth century, especially in hilly terrains with shallow soil that was not well suited for farming but could sustain ranching (cattle, sheep, and goat) activities. Farming also survived as local endeavor during the twentieth century but was limited to those areas with better and more fertile soil that prevailed throughout much of the region. Many residents ranched and farmed on their property and made the most productive use of their land.

Site-Specific Historic Context

The parcel of land that includes the Magill property lies within the Talbot C. Chambers Survey, which encompasses a fourth of one league (1,107 acres). On March 12, 1845, the quarter-league was patented to Greenleaf Fisk, a notable figure in the history of the Texas Republic and early statehood. Elihu C. Mauldin acquired a total of 624 acres of the Chambers Survey between 1855 and 1857 and subsequently sold it to Joseph K. Campbell in 1858. In December 1869, Campbell sold 1,100 acres out of the Chambers and Elijah D. Harmon Surveys in Williamson County to James Patterson Magill, Sr.

Prior to purchasing this land, Magill lived in Burnet County with his wife and six children, where he served as county clerk. In 1861, he resigned his position to represent Burnet, Llano, and San Saba

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counties in the Texas Legislature. From available tax roll and census data, Magill was a farmer; however, the *Handbook of Texas* also reports that he served one term as a Williamson County commissioner. In 1880, ad valorem tax rolls indicate that Magill had extensive land holdings in the county and also paid taxes on 30 cattle, 20 hogs, and 16 horses or mules, which indicates that his agricultural activities extended beyond the cultivation of crops. Whereas many families who settled on lands west of present-day US 183 raised cattle in the 1870s and 1880s, the general area that includes the Magill property encompassed an alluvial valley along Brushy Creek that attracted a large number of farmers. The fertile soil in proximity to the waterway was more conducive for the cultivation of crops and supported farmers who grew Indian corn, oats, and wheat. By 1900, Magill further diversified his activities and had a sheep herd that included 250 animals. That same year, he sold approximately 405 acres, which included the present parcel, to Jesse E. Humble.

Jesse E. Humble is listed in the 1900 census as a general merchant; however, ad valorem tax rolls for 1901 document that Humble paid taxes on sheep, which indicates that at least a portion of the land continued to be used for grazing and/or ranching purposes. By 1910, Humble no longer paid taxes on a sheep herd but he paid taxes on a small number of horses and cattle. In 1908, Humble sold a 48.37-acre parcel at the northwest corner of the property to E.A. Davis in 1908. The remaining 356.63 acres were sold in December 1923 to C. Frank Faubion, who owned the land for the next 23 years.

Thelma L. Shows acquired the property in August 1946, and she subsequently partitioned separate parcels of land, which she sold off over time. In 1959, 75.4 acres was conveyed to the Veterans Land Board of Texas, 118.25 acres was sold to Elvis C. and Laverne N. Holloway in May 1960, and the remaining 171.14 acres containing the current parcel was sold to Keith D. and Wanda Zimmerman in April 1960 (*Figures 7-30 and 7-31*). This acreage was further subdivided and sold two years later. The current owner, Robert F. Higginbotham, purchased the property in July 1966. Of the original 88.3 acres purchased, he later conveyed 0.2088 acres in two portions to Williamson County for the 183A Toll ROW in 2004.¹¹

Resource Descriptions

The historians relied on current bird's eye views and aerial photographs from Google and Bing since right-of-entry was not granted. The main building within the primary compound is a one-story, single-family dwelling. It is situated on the highest part of the property and faces towards the south. It stands within the domestic zone that is defined by a wooden picket fence and mature trees. The building is a side-gabled, massed plan with a gable-end exterior stone chimney. The primary façade has an inset, full-width porch. A rear-gabled wing extends from building's west end. Southwest of the main building is a front-gabled transverse barn. The date of the barn is unknown, but it is present on the 1937 Tobin aerial photograph. It has a rear addition with open front bays and a curvilinear roof. The barn and addition are

¹¹ For a more detailed history of the property, please see the historic resources survey report entitled, Final Historic Resources Survey Report, 183A Toll: From Ranch-to-Market Road 620 to Three Miles North of the Leander City Limits, Williamson and Travis Counties, Texas, Work Authorization 578 06 SH002, March 2010.

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unified by a white picket fence enclosure to the southeast. Located between the main building and the barn is an above-ground cistern and a cement water trough.

Questions to Guide Analysis of Information Obtained During Research and Field Investigations

Many of the questions posed in the evaluation guidelines are not applicable to this property and investigations; however, relevant questions are restated in italics and are followed by responses.

- *Does the historic context provide the framework for understanding the events, patterns, and themes that are directly associated with the recorded agricultural properties?*
Yes, the historic context identifies patterns associated with the recorded agricultural property.
- *What are the broad agricultural and land-use patterns observed during field investigations, and are they consistent with what the Research Design implied or suggested?*
The current parcel consists primarily of two distinct land-use patterns that are consistent with historic trends and seem to be based on topographic variations within the existing parcel boundaries. Historically, much of the level land that was partitioned and sold during the twentieth century was used to grow crops, and the hilly terrain that encompasses the northern part of the current parcel was used for raising livestock. Based on an analysis of historic maps and aerial photographs, land uses and activities appear to remain consistent since the close of the period of significance and likely date back to the nineteenth century based on ad valorem tax rolls and agricultural schedules.
- *What historical factors may have affected the kinds of buildings that are present, the use or functions of these resources, or the way agricultural land-use patterns shifted and changed over time?*
The largest factor contributing to land-use patterns and activities is not historic, but topographic. Based on analysis of historic maps and aerial photographs, land uses and activities appear to remain remarkably consistent over time and present a historic character that can be traced back as far as 1937 through historic aerials and likely extend to much earlier period. In addition, the extant historic-age resources appear to date to the close of the period of significance.¹²
- *How prevalent are new buildings and structures within the APE and study area? What impact have they had on the historic landscape?*
No non-historic age structures are known to exist within the Magill property. With the exception of the construction of 183A Toll, the area surrounding the property has largely remained rural since the period of significance, although there is encroaching residential, commercial, and industrial development. A lack of right-of-entry did not allow project historians to determine if new development is visible from within the property or interrupts important vistas.

¹² A 1966 topographic map shows the presence of an additional agricultural outbuilding northwest of the main house; however, the building is no longer extant on the 1992 topographic map.

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- *How prevalent are vacant buildings? Have unoccupied/unused buildings been converted to new uses, or are they abandoned and in varying states of deterioration or disrepair? Does their current appearance still convey information about their previous functions?*

According to recent aerial photography, there appear to be no vacant buildings located on the Magill property.

- *Did changes to the resources and within the associated landscape occur prior to the survey cut-off date?*

The greatest changes to the Magill property after the survey cut-off date are the partitioning of the historic farmlands and the construction of 183A Toll southwest of the property. The extant historic-age resources and landscape within the existing parcel remain intact since at least 1937, the date of the earliest aerial photograph available.

- *What do research and field investigations suggest may be the basis for defining the period of significance in the study area?*

The period of significance for the Magill property begins in 1869, when J. P. Magill established the farm, and ends in 1959, when the owners began partitioning the historic farmlands.

STEP 2: ASSESS SIGNIFICANCE UNDER THE NATIONAL REGISTER CRITERIA FOR EVALUATION AND CRITERIA CONSIDERATIONS

Assessing Significance under Criterion A

This property is closely associated with agricultural practices and production in southwestern Williamson County from the late nineteenth and early twentieth centuries. The parcel includes a primary cluster of buildings, mostly dating from the late nineteenth century, and land-use patterns that are unchanged since 1937. Contextual research indicates that the farm was established as early as 1869 by James P. Magill, who ranched and farmed the land for 31 years. At its peak, the farm encompassed approximately 1,100 acres, and corn, oats, and wheat were the primary crops grown. Magill listed his occupation as a farmer in census records and supplemented his income by raising a limited number of horses, cattle, and sheep. Such a trend was common throughout areas along or immediately west of the Balcones Escarpment. Agricultural practices on the property during the nineteenth century appear to have been maintained well into the twentieth century when the land was sold to other individuals. According to deed research at the Williamson County Clerk's office, approximately half of the farm was sold to a Leander merchant, J. E. Humble, in 1900, and he also maintained a sheep herd. Except for an additional 48-acre parcel that was sold in 1908, the remaining portion of the property remained intact until the 1960s.

This property possesses significance under Criterion A at the local level in the area of agriculture as a relatively rare example of a late nineteenth century agricultural property in the Leander vicinity.

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- *What period does the property represent, and was this era important in local agricultural history?*
The Magill property is reflective of agricultural practices and production in southwestern Williamson County from the late nineteenth and early twentieth centuries, an important era in local agricultural history.
- *Are agricultural and land-use patterns significant at a local, state, or national level?*
The agricultural and land-use patterns are significant at a local level.
- *Is the property an example of a historic farm, ranch, or dairy farm that serves to illustrate agricultural activities over time? Is it noteworthy and, if so, why?*
Yes, the property illustrates farming and ranching activities over time and is noteworthy because it serves as a tangible link to the area's nineteenth century agricultural heritage and survives as a relatively rare example of a late nineteenth century agricultural property in the Leander vicinity.
- *Does the property derive significance because of its association with innovative agricultural practices, techniques or procedures?*
No information obtained during intensive-level research indicated that the agricultural property is associated with innovative agricultural practices, techniques, or procedures.
- *Does the property derive significance because the type(s) of crops cultivated on the land marked a departure from previous agricultural practices and introduced a new product to the area or region?*
The agricultural complex does not derive significance from the types of crops cultivated on the land. Based on the limited amount of site-specific available, the types of crops harvested on the property typify general trends in local agricultural production.
- *Does the agricultural property possess significance when evaluated from the perspective of the historic context? Does that significance stem from the collection of buildings and land-use patterns that reflect important agricultural patterns from the past?*
Yes, the complex possesses significance stemming from both the collection of buildings and the land-use patterns that reflect important agricultural patterns from the late nineteenth and early twentieth centuries. It survives as a good local example of historical agricultural trends that have largely been compromised because of the area's rapid growth and development.
- *Does the property derive significance because it was used to develop or improve distinctive breeds of livestock, etc.?*
Intensive-level research did not indicate that agricultural complex developed or improved distinctive breeds of livestock.
- *Is the property a good local example of agricultural practices associated with an ethnic or cultural group, and does it retain the qualities that demonstrate the distinctive agricultural practices of that group?*
Based on the characteristics of main house and land-use patterns, the property is representative of the Anglo-American traditions from the southern United States.

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- *Does the property derive significance because it is an early or noteworthy example of the effects of a government-sponsored program that changed or influenced agricultural patterns?*
The agricultural complex is not known to be associated with any government-sponsored programs.

Assessing Significance under Criterion B

Contextual research indicates that this property is closely associated with James D. Magill. According to the *Handbook of Texas*, Magill served as a second lieutenant in the Texas Rangers during the Mexican War. He later served as county clerk of Burnet County, but resigned in 1861 to represent Burnet and adjoining counties in the Texas Legislature. Magill purchased land in Williamson County in 1869 and established this farm near present-day Leander. While a resident of Williamson County, he served one term as a county commissioner and served when the commissioners approved the construction of a new Preston & Ruffini-designed county courthouse in 1877. Despite this strong historical association, the property does not derive significance because of any contribution Magill made to agriculture. Rather, J. D. Magill is noteworthy for his contributions in the area of politics/government, which is independent of the agricultural context. In addition, other resources may survive in Burnet County that are also representative of his civic and political contributions to local history; however, this property is the only known surviving resource associated with Magill. No other property owners appear to be significant for their contributions to agriculture or any other historic theme, pattern, or event.

- *What are the contributions of the individual and how did they encourage, improve, or support agricultural activities?*
J. D. Magill is not known to be significant for his contributions to agricultural activities.
- *Why is the individual significant in history; are there other properties that are a better illustration of that individual's significance?*
J. D. Magill is significant for his civic and political contributions to local history. Although other resources may survive in Burnet County that are also representative of these contributions, the house and associated resources represent the only known surviving property associated with Magill.
- *Did the person invent important agricultural machinery?*
Research did not reveal that J. D. Magill invented any important agricultural machinery.
- *Did the person develop new strains of specific crops?*
Research did not reveal that J. D. Magill developed any new strains of specific crops.
- *Was the person a leader in agricultural organizations?*
J. D. Magill was not associated with any known agricultural organizations.
- *Did the individual attain significance for contributions made to the cultivation, harvesting, or production of crops?*
J. D. Magill did not make any known contributions to the cultivation, harvesting, or production of crops.

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- *Did the person embrace new technologies or practices that improved the quality of livestock or increase the profitability, marketing, or distribution of livestock and related by-products?*
Research did not reveal if J. D. Magill was involved in new technologies or practices that improved the quality of livestock and related by-products.
- *Did the individual contribute to efforts to expand dairy operations and its profitability through innovative means?*
Research did not reveal that J. D. Magill was involved in dairy operations.
- *What is the association of the property with an important agriculturist?*
There is no known association of the property with an important agriculturist.

Assessing Significance under Criterion C

Although right-of-entry was not granted to conduct field survey, analysis of aerial photographs reveals that the agricultural property includes at least two buildings (main house and barn), as well as an above-ground cistern and cement water trough. Comparison with contemporary buildings in the surrounding area indicates that the main house is a relatively rare surviving example of a vernacular domestic type that once prevailed in rural Williamson County, and is therefore significant under Criterion C at the local level in the area of architecture.

- *Is the building significant because it displays noteworthy craftsmanship in its construction or embellishment?*
Lack of access to the property prohibited a thorough assessment of the building's physical attributes.
- *Does the building exemplify methods of construction that are common or unusual within the APE and study area?*
Based on bird's-eye views of the property, the main house appears to be a relatively rare surviving example of a vernacular domestic type that once prevailed in rural Williamson County. The remaining resources are common examples of their type. It is similar to the Mason House, located at 1101 South Baghdad Road in Leander, Texas.
- *Is it a unique or rare example of a building type or form? Is it common in the surrounding region, and does it reflect vernacular or folk traditions of an ethnic group or culture?*
The main house reflects building traditions associated with Anglo-American settlers from the South. It is a rare surviving example of a once common late nineteenth century domestic form in the region. The remaining resources on the property appear to be typical examples of common agricultural property types. Based on an analysis of aerial imagery, the above-ground cistern is a building type that is prevalent throughout Central Texas. In addition, the barn appears to be a general purpose barn that many farmers and ranchers in the region used for a variety of purposes.

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- *Does a building represent an intact example of its kind from a particular time in history? What makes it significant for that reason?*

The main house represents an intact example of a vernacular building form that was utilized from the mid-nineteenth century to the early twentieth century. It is significant because it embodies distinctive characteristics of its type, period, and method of construction. The remaining resources are also intact examples of their type.

- *Is it noteworthy because it embodies the assimilation of a distinctive group into the dominant culture or society in surrounding areas?*

The resources are not noteworthy for the assimilation of a distinctive group into the dominant culture in surrounding areas.

STEP 3: DEFINE PERIOD OF SIGNIFICANCE

The period of significance for the Magill property begins in 1869 when J. P. Magill established the farm, and ends in 1959 when the owners at that time began partitioning and selling off other tracts of land. However, the core of the property is largely intact.

STEP 4: ANALYZE THE ASPECTS OF INTEGRITY

Location

The house, the associated barn, the cistern, and water trough are present at their current location on a November 1937 aerial photograph. Therefore, the property's integrity of location remains intact within both the domestic work zone and the agricultural work zone.

Design

The main house is a late nineteenth century, one-story, single-family dwelling. It features a side-gabled roof and an inset, full-width entry porch. A rear-gabled wing extends from the west end. The house faces south and is surrounded by a wooden picket fence and mature trees. Southwest of the house is a front-gabled barn. It has a rear addition with open front bays and a curvilinear roof. The barn and addition are unified by a white picket fence enclosure to the southeast. The physical appearance of the house and barn are integrated by the use of the same exterior cladding and roof covering. An above-ground cistern and a cement water trough are located between the house and barn.

Lack of access to the property prohibits a more-thorough assessment of the building's physical attributes, but based on bird's eye views of the property, the house retains its basic form and massing and it lacks any discernible alterations, changes, or non-historic additions. The barn also appears to retain its integrity of design. Historic and current aerial imagery analysis does not suggest that any buildings on the property were constructed outside the period of significance. The design of land-use patterns on the associated agricultural land remains intact as well. Therefore, because the domestic work zone, agricultural work zone, and associated lands all retain their integrity of design, the overall property retains this aspect integrity.

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- *Are alterations more severe on the main building? How does that affect integrity of design to the property as a whole?*
The main house lacks any discernible alterations, changes, or non-historic additions.
- *If alterations are more pronounced and extensive to associated outbuildings, what is the combined effect on these changes to the property as a whole?*
Although project historians were not granted access to the property, a bird's-eye view of the associated outbuildings revealed that the only alteration is a rear addition on the barn. It is unknown whether or not this addition was constructed within the period of significance.
- *Has the construction of non-historic buildings altered the spatial relationships among the historic buildings; how have they affected agricultural activities?*
There are no known non-historic structures located within the Magill property, based on a review of aerial images.
- *Has the functional organization of the property changed?*
According to a comparison of historic and current aerial photographs, the functional composition and organization of the entire complex appears to be intact.

Setting

As seen in a comparison of aerial photographs from 1937 and 2009, the overall landscape of the property retains the qualities that make it significant for its historical association. In 1937, most of the land immediately surrounding the extant historic-age resources is shown to be open pastureland with a scattering of trees. The most heavily wooded area is at the northernmost corner of the property, north of the house and associated outbuildings. The remaining acreage contains a series of tilled and terraced fields that were used to grow crops; however, the pastureland surrounding the house is not believed to have been in cultivation based on vegetation and topography. The shape and land use of the parcel is largely unchanged in the 2009 aerial. In addition, the circulation patterns are relatively unchanged. The primary roads within the property intersect west of the buildings, provide access to pastureland, and at one time extended to adjoining properties, neighbors, and transportation routes in the area during the period of significance. Furthermore, with the exception of the construction of 183A Toll, the setting surrounding the property has largely remained rural since the period of significance. No non-historic buildings or landscape features have been added to disrupt the setting of the domestic work zone or the agricultural work zone. Therefore, the Magill property retains its integrity of setting on the agricultural lands as well as within the domestic work zone and agricultural work zone.

- *Does the overall landscape of the agricultural property retain the qualities that make it significant for its historical association?*
Yes, the overall landscape retains the qualities that make it significant for its historical association. In its present state, the property includes both improved and unimproved land. Although former tilled fields are now grasslands, the property's overall character is consistent with former uses. An analysis of historic maps and aerial photographs indicates that land uses and activities appear to remain remarkably consistent over time and present a historic character that can be traced back as far as 1937 and likely much earlier. Agricultural schedules from 1870

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and 1880 indicate that property has been used to raise livestock and cultivate crops. The two types of agricultural activities are consistent with historic patterns.

- *Do the landscaping and plantings within the domestic work zone represent important elements that distinguish this cluster from other parts of the property?*
Lack of access to the property prevents a thorough assessment of the landscaping and plantings within the domestic work zone.
- *Have historic circulation patterns remained sufficiently intact over time to remain recognizable on the landscape?*
Yes, the circulation network within the Magill property has remained largely intact and unchanged since at least the 1930s as revealed by historic aerial photographs.
- *Did landscape changes contribute to agricultural operations on the property and are they important to its significance?*
The use and organization of the property historically has been divided according to natural vegetation and topography. Most of the land immediately surrounding the main house, barn, cistern, and water trough was historically open pastureland with a scattering of trees. The remainder of the property consisted of a series of tilled and terraced fields used to grow crops. Evaluation of current aerial photographs confirms that these landscape patterns are still extant.
- *What are the effects of underground pipelines, power transmission lines, and communication towers to an agricultural property?*
The Magill property does not exhibit any of these features.
- *How has encroachment from development on adjoining properties affected the ability of the property to present its sense of the past?*
With exception of the construction of 183A Toll on the southwest boundary of the property, the area immediately surrounding the Magill property at the time of the survey remains rural.
- *Has the land been manipulated with contouring, etc., to improve farming or control erosion? Did that work occur during the period of significance?*
During the period of significance, most of the land historically associated with the Magill property consisted of a series of tilled and terraced fields used for growing crops. However, the remaining portion of land currently associated with the property consisted of uncultivated pasture land.

Materials

Since access to the property was not granted, it is difficult to assess integrity of materials. As seen in the 2009 aerial photo, the house and barn exhibit the same exterior cladding and roof covering; however, it is unknown if this cladding was replaced outside the period of significance.

- *Is the alteration a response to changing conditions and trends related to agriculture?*
Lack of access to the property prohibits a thorough assessment of the building materials.

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- *Does the introduction of materials that do not date to the period of significance detract from the historic character of the property to such an extent that it no longer contributes to the significance of the property?*

Lack of access to the property prohibits a thorough assessment of the building materials.

Workmanship

It is difficult to assess integrity of workmanship since access to the property was not granted.

- *Do the buildings and structures display noteworthy detailing in their construction, finish, or embellishment?*
A lack of access to the property prohibits a thorough assessment of the building's construction, finish, and embellishment.
- *Is the craftsmanship indicative of a particular ethnic group and does it retain the physical traits that make association evident?*
A lack of access to the property prohibits a thorough assessment of the building's craftsmanship.
- *Have distinctive physical features been covered, replaced, or removed?*
A lack of access to the property makes it difficult to fully ascertain any changes to the buildings and structures.
- *Are these changes and alterations easily reversible and how do they diminish from the property's historic character?*
A lack of access to the property makes it difficult to fully ascertain any changes to the buildings and structures.

Feeling

As evidenced from the 2009 aerial photos used to evaluate the complex, the Magill property has seen few changes since the end of its period of significance. There appear to be no abandoned or vacant buildings, the extant buildings show very few, if any, physical changes, and no buildings were constructed after the close of the period of significance. In addition, there is no evidence of a substantial change in land use of the surrounding fields that are still associated with the property. Furthermore, with the exception of the construction of 183A Toll southwest and adjacent to the parcel, both the setting and boundary demarcations remain intact. Therefore, the Magill property retains its integrity of feeling within the domestic work zone, the agricultural work zone, and the associated lands.

- *Does the main building within an agricultural complex fall within the established period of significance? If so, does it still convey its integrity of design, materials, and workmanship?*
The main house falls within the period of significance. According to current bird's eye views of the property, the house retains its basic form and massing and, therefore, retains its integrity of design. A lack of access to the property prohibits a thorough assessment of integrity of materials and workmanship.

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- *What is the combined effect of alterations, post-dating the period of significance, to the main building and associated outbuildings?*
According to bird's eye view, the main building and associated outbuildings lack any discernible alterations.
- *How have changes to the land and land use altered the historic character of the property and would a person from the period of significance still recognize the property from his or her association with the property?*
There appear to be no substantial changes to the land or land use since the period of significance; therefore, a person from that time would still be able to recognize the property from his or her association with it.
- *How has the introduction of new buildings and structures affected the historic qualities of the domestic and agricultural work zones and the associated landscape?*
There are no non-historic age structures located within the Magill property.
- *Is the remaining acreage of land large enough to convey major agricultural functions?*
Yes, the remaining 85.7 acres of land is large enough to convey major agricultural functions.
- *Is the complex still in use or has it been abandoned?*
Right-of-entry was not granted for this property and since the buildings are located too far away to view from the right-of-way, it is unknown whether or not this complex is still in use or was abandoned.
- *How has the setting of the surrounding area changed? Have these changes affected the spatial relationship of the agricultural complex to other resources?*
With the exception of the construction of 183A Toll, the setting surrounding the property has largely remained rural since the period of significance.
- *Is there still a distinct delineation between domestic and agricultural spaces? How has the relocation of buildings affected this delineation?*
None of the extant buildings on the complex have been relocated. A broken wooden fence and mature trees surround the main house and separate it from the surrounding agricultural spaces.
- *Are there cultural techniques still reflected in the property?*
The Magill property reflects prevailing Anglo-American traditions that characterized much of the surrounding region.

Association

Finally, the Magill property retains its integrity of association. Despite the partitioning of most of the associated farmlands, the remaining 85.7 acres provide enough acreage to convey the major agricultural functions. In addition, the land-use patterns dating from the period of significance appear to be intact. As a result, the domestic work zone, agricultural work zone, and associated lands all retain their integrity of association.

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- *Is the property still functioning as an agricultural property?*
Right-of-entry was not granted for this property; therefore, it is unknown if the property is still functioning as an agricultural property. However, aerial photos confirm that the general land-use patterns remain evident.
- *If the property is no longer used for agricultural activities, but historic-age resources and fields are still intact, does the property retain a sense of its original and historic function?*
Although a lack of right-of-entry prohibits project historians from determining if the property is still used for agricultural purposes, a comparison of historic and current aerial photos confirms that, with the exception of one agricultural outbuilding, the historic-age resources and fields dating to the close of the period of significance are intact. Therefore, the Magill property retains a sense of its original and historic function.
- *Do ongoing agricultural operations date to the period of significance? How have they changed over time?*
Right-of-entry was not granted for this property, therefore it is unknown if the property is still functioning as an agricultural property. However, aerial photos confirm that the general land-use patterns remain intact from the period of significance.
- *How do changes in land use and agriculture-related patterns and activities contribute to or detract from the property's overall historic character?*
Based on an analysis of historic maps and aerial photographs, land-use patterns and activities within the parcel appear to have remained fairly consistent over time.
- *How has the associated acreage changed over time, and how does this affect the land-use patterns and ability of the property to convey its agricultural use?*
At its peak the Magill property encompassed approximately 1,100 acres of land. This land was gradually partitioned and sold off. In 1959, the end of the period of significance, the Magill property consisted of 356.63 acres. Since then, the property has been further subdivided and sold so that only 85.7 acres remain. In spite of this, land use and activities on the remaining acreage remain consistent over time and is able to present a historic character that is traced back to the period of significance.

STEP 5: ANALYZE THE CHARACTERISTICS OF A HISTORIC RURAL LANDSCAPE

Land Use and Activities

According to archival research and fieldwork, the Magill property was historically much larger than its current size. Additionally, it was divided into three zones: uncultivated land (livestock grazing), a central core (divided into agricultural and domestic work zones), and cultivated land (crop production for animal fodder and subsistence farming). Today, the property consists primarily of the uncultivated land and the central core, and all of the land historically used for crop cultivation was partitioned and sold after the period of significance. Overall, land-use patterns and activities appear to be based on topographic variations within the existing parcel boundaries and within the area that historically represents the Magill property. Based on analysis of historic maps and aerial photographs, land use and activities

appear to remain remarkably consistent over time and present a historic character that can be traced back to 1937, and possibly earlier (*Figures 7-32 and 7-33*).

Patterns of Spatial Organization

The macro-patterns of spatial organization of the Magill property largely were dictated by the natural environment. The house and associated outbuildings are placed on the highest part of the property and are oriented toward the south. Historically, this location provided a majestic view of the cultivated farmlands. Historic aerials indicate that the existing configuration of resources within the property is unchanged. In addition, the patterns observed at the property are reflective of trends seen at agricultural properties in other parts of western Williamson County. Within the domestic and agricultural work zones, the existing buildings conform to a spatial organization that existed as early as the 1930s when the oldest known aerial photographs of the property were taken.

Response to the Natural Environment

The Magill property further reflects a strong response to the natural environment in its use of the land, and with its southwestern boundaries. The use and organization of the property historically was divided according to the natural vegetation and topography. The legal boundaries of the parcel were described and maintained according to land levels. As seen in a 1962 topographic map, the zigzag nature of the parcel's southwest boundary closely follows natural contour lines (*Figure 7-34*).

Cultural Traditions

The land surrounding the Magill property was settled in the mid-to-late nineteenth century by Anglo-Americans primarily from the southern states. Based on archival research and limited field survey, the property reflects these cultural traditions and is representative of the type of agricultural complexes historically found in this part of Williamson County.

Circulation Networks

The circulation network within the Magill property has remained largely intact since at least the early twentieth century. Historic maps and aerial photographs provide graphic evidence that the existing circulation pattern is relatively unchanged. The primary roads within the parcel are unpaved drives, which intersect west of the historic buildings. These drives provide access to the pastureland and extend to adjoining properties, neighbors, and transportation routes in the area. The 1937 aerial depicts the intersection of four unpaved roads in the immediate vicinity of the house. The primary road led south toward present-day CR 269. Another route led north to the J. C. Bryson Farmstead. A northeastern-oriented drive, which intersected the Old Lampasas to Leander Road (CR 270), connected the Magill property with the 114- and 110-acre parcels historically owned by the J. P. Magill family to the east. Finally, a short drive led southwest to the cultivated fields that have since been partitioned from the historic farm and are no longer part of the property. Three of the four routes are present on the 1962 topographic map. Despite minor changes, the circulation network within the property is largely intact and forms an important aspect of the historic landscape.

Boundary Demarcations

Legal boundaries and geography delineate the boundaries of the Magill property. The present parcel was part of the property owned by J. P. Magill, Sr. from the Talbot Chambers Survey. As previously mentioned, the southwestern parcel boundary is based on natural topographic lines that historically separated the uncultivated area from the tilled fields within the larger J. P. Magill property. The east and north boundaries follow the orientation and layout of the original Talbot Chambers Survey. Barbed wire fences delineate property boundaries and are often lined with trees that form a visual barrier and distinguish the property from its surroundings. Limited field survey and review of historic aerial photographs suggest that the boundary demarcations of the Magill property have remained consistent over time and reflect patterns that date back at least to the 1930s, if not earlier.

Vegetation Related to Land Use

Most of the land within the current boundaries of the property have remained uncultivated and likely were used primarily for grazing animals. The land contains grasslands with varying concentrations of juniper and other trees. Historically, this area was set apart from the rest of the farm, which generally contained tilled fields. Based on an analysis of historic maps and aeriels, vegetation related to land use is largely unchanged since at least 1937.

Buildings, Structures, and Objects

The buildings, structures, and objects within the Magill property reflect the prevailing agricultural character of the area and historic land-use patterns. The resources are located in a central core that includes both the domestic and agricultural work zones. Resources include the main house, a barn, a cistern, and a water trough. The resources were identified through an analysis of aerial photographs; however, other as-yet-unidentified resources may be present but are not visible from public right-of-way or aerial photographs or are noted on maps and tax records.

From a bird's-eye perspective, the main house resembles a small number of extant historic residences in the area, and appears to be representative of a vernacular building form that was utilized from the mid-nineteenth century to the early twentieth century. Northeast of the house is a front-gabled transverse barn with a rear addition that appears to have been used for general purposes. The barn and addition are unified by a white picket fence enclosure to the south. An above-ground cistern and cement water trough are located adjacent to the house and barn.

The house, barn, cistern, and water trough reflect the livelihood of the mainstream agriculturalist in southwest Williamson County in the late nineteenth century and early twentieth century. The common physical traits and qualities that the historic resources possess, as well as their support for continued agricultural-related uses of the land, add to their cohesiveness with the surrounding area.

Clusters

The cluster of resources at the Magill property resulted from function and geography. They are located near the center of the parcel and are not clearly visible from any public right-of-way. The resources

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supported the domestic and agricultural operations that took place on the associated lands. The most distinctive feature within the cluster is the main house, which appears to date to the late nineteenth century based on its physical characteristics. The existing cluster of buildings and structure appears to retain its historic character to a noteworthy degree.

Archeological Sites

For the purposes of this study, archeological sites are not part of the evaluation process nor are they known to exist at the Magill property.

Small-Scale Elements

This aspect of the historic rural landscape of the Magill property is largely unevaluated since right-of-entry to the parcel was not granted. Further and more in-depth field investigations may identify small-scale elements that contribute to the rural landscape of the parcel.

STEP 6: IDENTIFY INTEGRITY THRESHOLDS FOR NRHP ELIGIBILITY

Eligibility under Criterion A

The Magill property retains a high degree of integrity in the areas of location, setting, feeling, association, and design. Due to a lack of right-of-entry for the parcel, integrity of materials and workmanship is unknown. The main building of the property (the house), remains at its original location, as does the agricultural building (the barn). As such, both the domestic and agricultural work zones remain intact. In addition, the property retains its original relationship among the buildings, natural features, and landscape elements and presents a clearly defined circulation network between the three zones (domestic work zone, agricultural work zone, fields/pastures). Furthermore, with the exception of the construction of 183A Toll, the parcels of land immediately adjacent to and surrounding the agricultural property are also reflective of the agricultural heritage of the area. Because of this, the property is able to convey a sense of the time and place from when it achieved significance, in spite of a substantial loss of the original acreage.

Eligibility under Criterion B

Integrity thresholds for the Magill property under Criterion B are similar to those for Criterion A. As mentioned above, the property retains integrity in the areas of location, setting, feeling, association, and design. Integrity of materials and workmanship is largely unknown since right-of-entry was not granted. As such, the property is able to convey a sense of time and place from when it was occupied by J. P. Magill. While the property does not derive significance for Magill's contribution to agriculture in the region, it is significant for its association with political leader of the nineteenth century who served as a Williamson County Commissioner.

Eligibility under Criterion C

Even though the property's integrity of materials and workmanship is unknown, the property appears to retain its integrity of design, based by a comparison of historic and current aerial photos. The main

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house and barn retain their basic form and massing and lack any discernible alterations. In addition, there appears to be no modern buildings introduced into the landscape, and only one historic building has been demolished since the end of the period of significance. The landscape features of the remaining 85.7 acres are clearly intact, and there appears to be no change in land use since the 1930s. Therefore, the Magill property meets the integrity threshold for eligibility under Criterion C.

Eligibility under Criteria A, B, and C

The Magill property is recommended eligible for the NRHP under Criteria A, B, and C, and it retains integrity of all three zones (domestic, agricultural, and fields/pastures).

STEP 7: DETERMINE AND JUSTIFY PROPERTY BOUNDARIES

The NRHP boundaries of the Magill property encompass the remaining acreage and follow the legal parcel boundaries. As previously mentioned, the southwestern boundary is based on natural topographic lines that historically separated the uncultivated area from the tilled fields within the larger property. The east and north boundaries follow the orientation and layout of the original survey.

STEP 8: CLASSIFY RESOURCES AS CONTRIBUTING AND NONCONTRIBUTING ELEMENTS

Contributing Resources

The contributing resources on the Magill property include the main house, the agricultural barn, the above-ground cistern, the cement water trough, and the associated fields and drives. All of these resources retain the salient and character-defining features that identify the land as a late nineteenth century agricultural property and enable it to convey its significance as such.

Noncontributing Resources

The Magill property does not contain any resources that were constructed after the period of significance. In addition, the extant resources retain a sufficient amount of integrity to all be considered contributing elements to the historic agricultural property.



Figure 7-28. Aerial photograph from Google Maps. (Source: <http://maps.google.com>, ca. 2009.)



Figure 7-29. Aerial view of historic-age resources, looking west. (Source: Google Maps, ca. 2009.)



Figure 7-30. Parcel sales of J. P. Magill property. (Source: Tobin aerial photograph, 1937.)



Figure 7-31. Parcel sales of J. P. Magill property. (Source: TNRIS aerial photograph, ca. 2004.)



Figure 7-32. Land-use patterns within Magill property. (Source: Tobin aerial photograph, 1937.)



Figure 7-33. Land-use patterns within Magill property. (Source: Google Maps, ca. 2009.)

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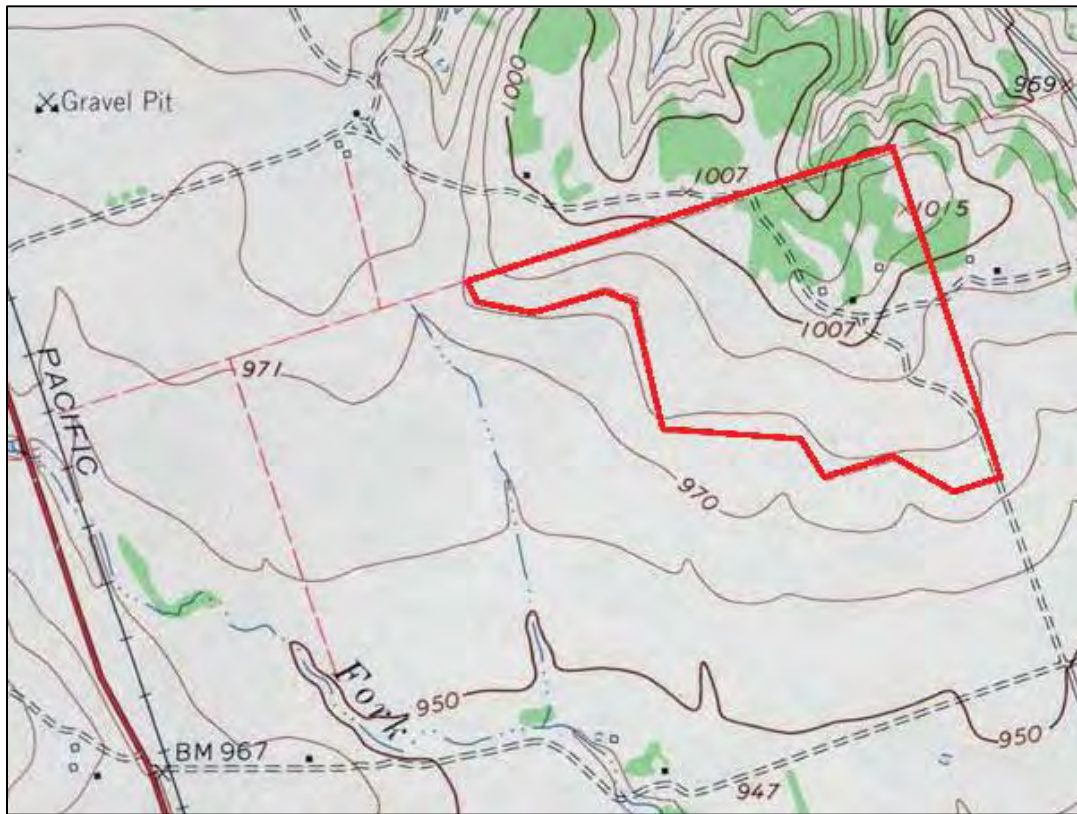


Figure 7-34. Response to natural topography at the Magill property. (Source: Leander Quadrangle USGS Topographic Map, 1969.)

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SECTION 8. CARTOGRAPHIC DATA AND GIS

SECTION 8. CARTOGRAPHIC DATA AND GIS

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INTRODUCTION

The use and analysis of maps and aerial photography is an important part of identifying appropriate historic contexts, completing fieldwork, and evaluating agricultural resources and landscapes for the National Register of Historic Places (NRHP). This chapter outlines commonly used cartographic materials (maps and aerial photographs) in Texas, the advantages and disadvantages of utilizing each of these materials, and guidance on using individual cartographic material types.

To aid researchers in their use of maps and aerial photography, this chapter is divided into two main sections: 1) Collections/Repositories and 2) Analysis. This chapter first presents basic information for representative maps within each type that note important cultural features, as well as explanations of how the maps can be used and where they are located. The examples in this chapter are among the most common and readily accessible cartographic types that can be used for historic resource surveys and historic context development. The collections and repositories summarized in this chapter include:

- **Texas Historic Overlay (THO)**
- **County Tax Appraisal District Maps**
- **County Tax Assessor-Collector Maps**
- **Land Ownership Maps and Accompanying Aerial Photographs**
- **General Highway Maps**
- **US Geological Survey Topographic Maps**
- **Stoner Ownership Maps and Aerial Photographs (Bexar County only)**
- **Soil Survey Maps**
- **Aerial Photographs**

The second part of this chapter provides guidance on how to utilize the maps and aerial photography using geographic information system (GIS) software. This section illustrates how GIS software can help researchers recognize patterns of development, document historical trends, and provide supplemental information for the identification and development of historic contexts, using examples for both macro-level and micro-level analyses. Coupled with the description of cartographic data collections and repositories, the information regarding GIS analysis will help the researcher utilize maps and aerial photography in the evaluation of agricultural resources and landscapes.

Although information in this chapter is specific to the 13-county region encompassing this project, the types of cartographic maps shown as examples often provide coverage of other parts of the state and have direct application for historic and archeological investigations in other settings. In addition, the information presented in the following pages is not comprehensive and, in fact, represents only a portion of the cartographic materials that can be used for GIS analysis. Additional research at local and regional repositories will identify other materials that can be scanned, geo-referenced, and integrated in a GIS-based file.

COLLECTIONS/REPOSITORIES

Texas Historic Overlay

The THO is the single best source of historic maps for GIS analysis, and many of the sample maps in this chapter are part of the invaluable THO collection.¹ TxDOT funded the compilation of the THO primarily for planning purposes, citing the need to identify cultural resource locations for anticipated or proposed transportation projects. Many of these planned transportation undertakings were for new location alignments or expanded transportation corridors through rural areas, where access can be limited by property owner permission or visibility from a public right-of-way (ROW). To compile and prepare the THO, TxDOT hired the Austin office of PBS&J (now part of Atkins North America), whose professional staff and consultants researched and evaluated cartographic data at national, state, regional, and local repositories.²

As originally envisioned, TxDOT intended the THO to extend over the entire state after the completion of a pilot study in the Houston District that limited coverage to counties within that TxDOT regional office. The success of this initial effort demonstrated the worthiness, manageability, and viability of the project's approach. Limited funding confined the implementation of the THO to a 156-county region that included the eastern, central, and southern portions of the state. Researchers, historians, and cartographers developed an extensive inventory of maps that served as the basis for map acquisition and reproductions with licensing agreements from selected repositories. The maps can be used for planning and reporting needs under the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA). Time and budgetary constraints played significant roles determining what maps were included in the THO. However, other factors, such as redundancy in map coverage, types of noted cultural features, and needs to fill temporal and geographic gaps, also affected decisions regarding the inclusion of cartographic materials. Targeted maps were scanned and geo-referenced into a GIS-based system designed to work with Esri's ArcGIS software. *Table 8-1* presents an overview of the different kinds of maps included in the THO, groups them by class or type, and notes the number in each category. Since each map is already geo-referenced, the system allows users to identify specific historic maps located near or within a particular project area (*Figure 8-1*). The system includes regional-scale as well as local-scale maps, allowing users to understand larger trends as well as specific information about a particular location.

¹ A copy of the THO can be obtained through TxDOT's Environmental Affairs Division. Usage requires the signing of an End-User Agreement because of copyright issues and other stipulations that certain repositories imposed about the use of their materials.

² Many of the repositories are also noted in the Research Guide section of this study. However, other repositories not listed in the Research Guide and the THO list also hold maps that are not included in the THO because these institutions and TxDOT were not able to agree on arrangements to incorporate maps into the GIS-based collection.

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Table 8-1. All Maps within the THO.³

Map Class	No. of Maps	Map Class	No. of Maps
Boundary Map (Jurisdictional)	129	Mineral Map	3
Cadastral Map (Large Scale)	169	Perspective/Panoramic Map	33
Canal/River Chart	15	Product Map	2
Cemetery Map	2	Quadrangle (31K, 24K, 62K, 125K)	1,751
Coastal Map	103	Railway Map	98
County Plat	56	Road Map (Highway)	16
Ethnographic Map	1	Route Map	40
Flood Control Map	1	Settlement Map	21
Geologic Map	12	Soil Map	79
Insurance Map (Fire)	1	Street Map (City)	91
Land-Use Map	9	Topographic Map (Non-Quadrangle)	43
Manuscript Map	8	Water Supply Map	230
Military Map	110		

The types of maps most useful for evaluating agricultural properties include cadastral (county tax appraisal district maps, county tax assessor-collector maps, and land ownership maps and accompanying aerial photographs), land-use, quadrangle, railway, road, soil, and topographic maps. However, others in the THO may also depict cultural features that could aid with the identification and assessment of agricultural properties. Researchers are encouraged to explore fully the wide range of maps in the THO that extend into an area that may be affected by a transportation undertaking.

³ The information presented in this table represents the entire collection within the THO. Only a small number of these maps extend into the study area. GIS users can identify relevant maps by drilling down through the many layers of cartographic data to identify those that are in the 13 counties in the Central Texas region targeted for study in this report. Maps at the GLO and other repositories also are available for researchers but are not geo-referenced and available for use through the THO.

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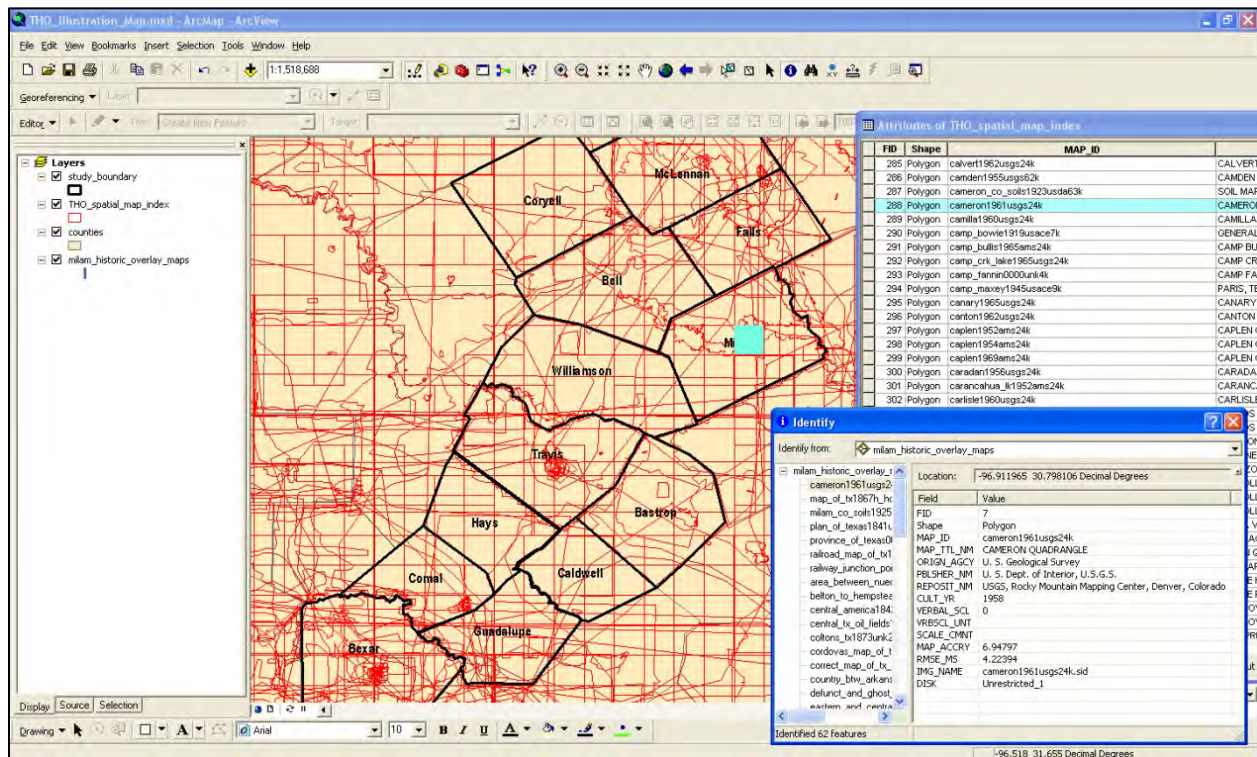


Figure 8-1. Detail of Texas Historic Overlay's Spatial Overlay view using Esri ArcView software. This screen capture shows THO map coverage for most of the study area. The red lines represent the outline of maps in the THO. The blue square identifies a specific map within the selected area. In this case, it is the Granger USGS Quadrangle map, which was published in 1964. The THO enables users to "drill down" through the series of maps that extend over a specific location or region. It is a very useful tool for identifying, documenting, and evaluating agricultural properties throughout the Central Texas area and many other parts of the state.

County Tax Appraisal District Maps

Among the most effective sets of cadastral-based maps that can be used for evaluating agricultural properties are county tax appraisal maps, which are often available in GIS format at county tax appraisal district offices. Among the types of features that are depicted on county tax appraisal maps are:

- **GIS-based shape files delineating parcel boundaries**
- **Current owner's name and address**
- **Acreage**
- **Improvements, such as houses, outbuildings, etc. (construction dates are not always accurate)**
- **Most recent deed transactions that can be used as starting points for legal and title research**
- **Roads**
- **Cemeteries**

The maps are important because they delineate the exact limits of properties (*Figure 8-2*) and, when used in combination with project schematics, can provide highly accurate maps that can be used to define an area of potential effect (APE) for a transportation undertaking. The maps can be used in the field to determine if an agricultural property extends into the APE and thus should be evaluated for the presence of historic resources. (For detailed information about preparing for and conducting fieldwork, see Section 3, Fieldwork Guide and Methodology.) Moreover, tax appraisal parcel data used as an overlay placed on historic topographic maps or aerial photos can provide graphic evidence of trends, land usage, and the existence of buildings at particular points in time relative to current legal boundaries.

While online search engines such as Google and Bing often depict parcel boundaries on their maps, the shape files and associated attribute tables in a GIS file with property-specific data can often be purchased for a relatively minimal cost from county tax appraisal district offices. Since the amount of information is often extensive, the data is usually copied onto a compact disk or flash drive, although arrangements are sometimes possible to download via the internet using file transfer protocol (ftp) software. The county tax appraisal district websites for the 13-county study are as follows:

- **Bastrop County:** <http://www.bastropcad.org/Appraisal/PublicAccess/>
- **Bell County:** <http://bellcad.org/>
- **Bexar County:** <http://www.bcad.org/>
- **Caldwell County:** <http://www.caldwellcad.org/>
- **Comal County:** <http://www.comalad.org/>
- **Coryell County:** <http://www.coryellcad.org/>
- **Falls County:** <http://www.fallscad.org/>
- **Guadalupe County:** <http://www.guadalupead.org/>

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- Hays County: <http://www.hayscad.com/Appraisal/PublicAccess/default.aspx>
- McLennan County: <http://www.mclennanad.org/>
- Milam County: <http://www.txcountydata.com/county.asp?County=166>
- Travis County: <http://www.traviscad.org/>
- Williamson County: <http://www.wcad.org/>

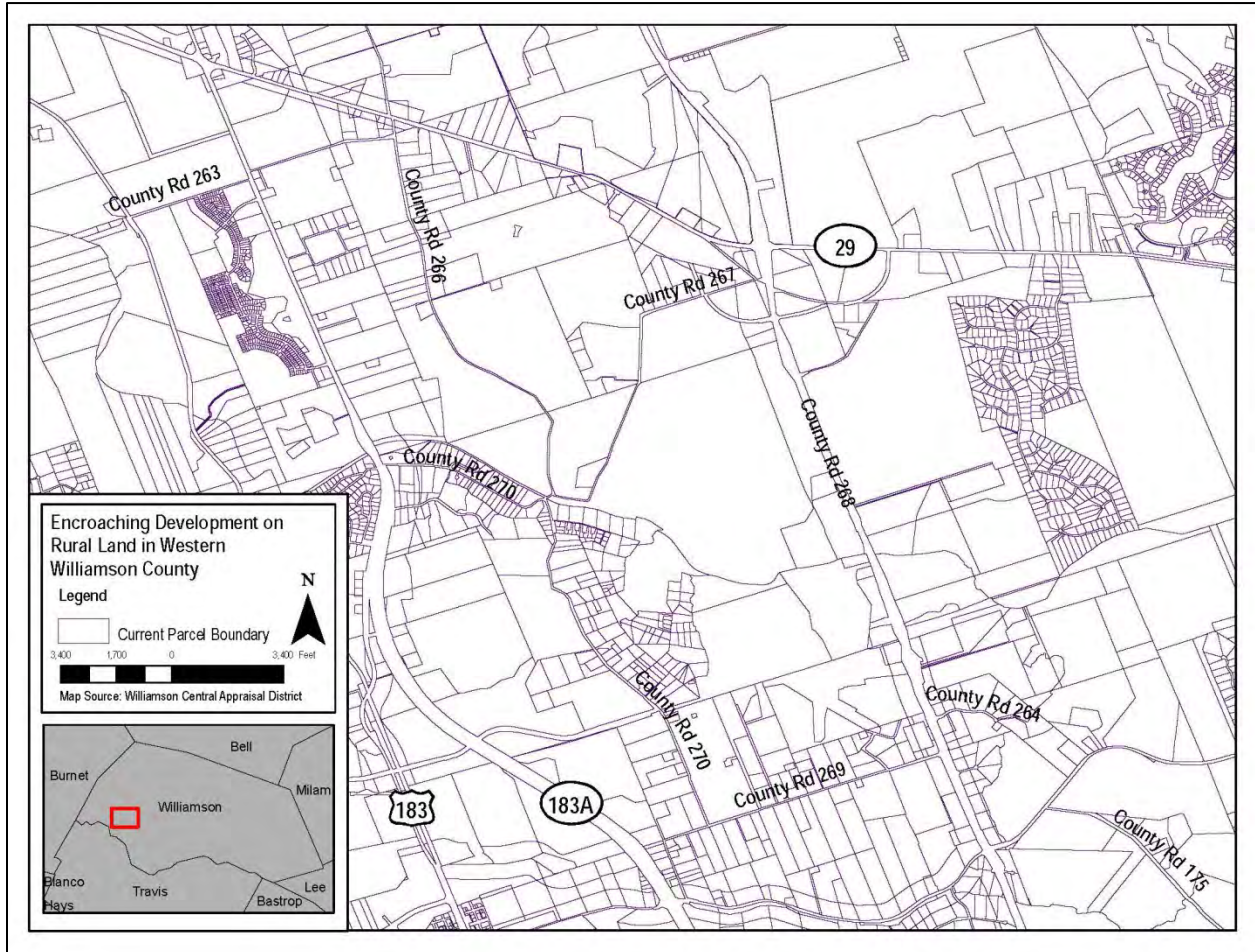


Figure 8-2. Parcel Data from Williamson County Appraisal District. The area includes a part of Williamson County that is experiencing rapid growth and change. Property boundaries along major roads, such as US 183, 183A Toll, SH 29, and CR 270, show how residential and commercial development is changing the larger rural tracts and, thus, the rural character that once prevailed in the area. New subdivisions with densely developed residential lots appear in sharp contrast to the larger tracts of land historically used for agricultural activities and production. Shape files showing parcel boundaries are a particularly useful GIS-based tool that can be overlaid with maps and aerial photographs to depict conditions at various years based on current legal boundaries. This capability is particularly useful for planning purposes and for the preparation of NEPA and NHPA compliance documents.

County Tax Assessor-Collector Maps

The county tax assessor-collector also holds a separate set of county-level cadastral maps that can be useful for evaluating changes in agricultural landscapes, property ownership, and transportation

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networks. Not every county has retained the maps due to changes in records retention schedules, but many tax offices have kept them because the assessor-collectors recognize their historical value. Typically, they are in volumes labeled “Block Books” or, simply, “Land.” Information embedded in such maps includes:

- **Outline of each General Land Office (GLO) grant**
- **GLO-assigned abstract number**
- **Survey number**
- **Certificate number**
- **Numbers of acres in the grant**
- **Name of original grantee**
- **Name of original patentee**
- **A scale, often in *varas* (a Spanish unit of length that is approximately 33.33 inches)**
- **Parcels within each grant, with acreages and measurements**
- **Natural features, such as rivers and streams**
- **Roads**
- **Railroads**
- **Bridges**
- **Cemeteries**
- **Public institutions**

The State of Texas required counties to begin keeping tax records in 1880, but some counties, such as Travis, began keeping the records in the 1870s. The records for most counties are incomplete. They often occur in folio-sized formats and consist of a rendering of the grant, followed by pages of text that list all the parcels within the grant. Both the maps and parcel listings are dynamic. That is, there may be notes made subsequent to the original creation of the map, and listings of ownership are available for multiple years.

Because the tax maps often date to the early twentieth century, they may be useful in conveying a sense of the scale of the ownership on a landscape prior to construction of transportation infrastructure such as the interstate highway system (*Figure 8-3*). Secondly, because the cartographic images can be paired with ownership information, the total record may be useful to a historian working to construct a chain of title for a tract of land within a grant. Finally, the attention paid to accurate renderings of the grants and tracts means that tax maps are easily incorporated in a GIS system.

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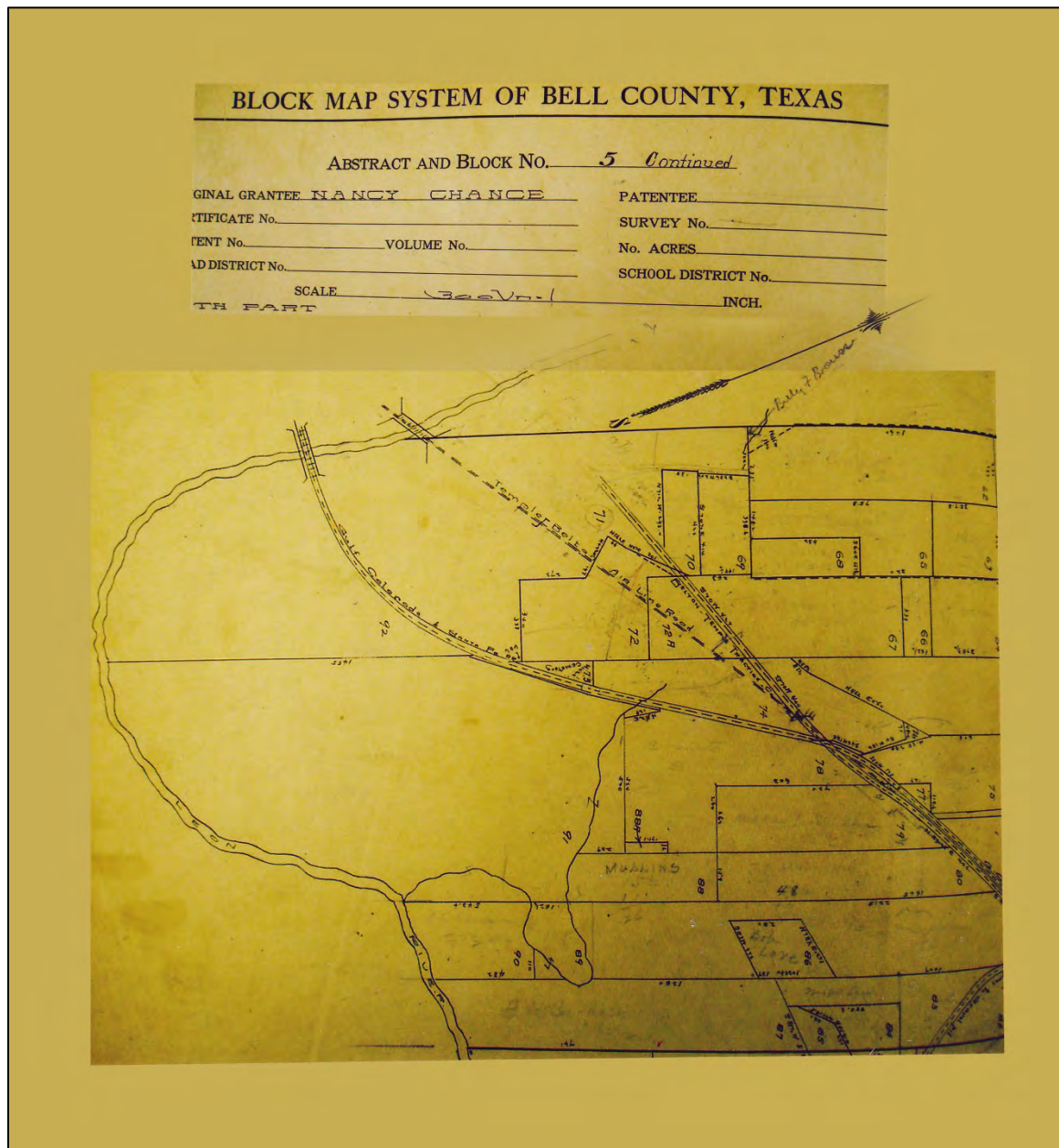


Figure 8-3. Detail of Map from Bell County Tax Assessor-Collector's Office. This composite image from two photographs shows a map type that is often available at the county tax assessor-collector's office. Coverage varies from county to county. They are an important source of information that can provide a snapshot about parcel sizes, owners, and existing cultural features (road networks, bridges, etc.) in a specific year. They may reveal much about the character of rural areas at the time the map was prepared.

Land Ownership Maps and Accompanying Aerial Photographs

The impetus for the creation of this cadastral data set stemmed from oil and gas explorations in the state during the early- to mid-twentieth century. Because they were created for the oil and gas industry, they delineated property boundaries and identified owners, information that was invaluable for developing leases for drilling purposes. The industry pioneer was Edgar G. Tobin of San Antonio, who created a company in 1928 that began producing this material on a county-by-county basis. Operations expanded into adjoining states, and a sample is provided in *Figure 8-4*. They often are referred to as “Tobin maps,” and coverage for Texas counties varies. Since they were published between the 1930s and 1970s, the Tobin maps provide a wealth of historical information and include the following:

- Legal boundaries of parcels
- Land survey information (original grant names and boundaries; abstract numbers)
- County lines/boundaries
- Property ownership recorded at time of mapping (name, acreage)
- Roads
- Schools, churches, and cemeteries
- Pipelines
- Land/water forms

The maps are especially useful for documenting the size and shape of individual land parcels for a particular year. Used in combination with current parcel data, they can also depict how parcel sizes may have changed over time. For example, a 1940s Tobin ownership map might indicate how a property today was once part of a much larger property. Tobin maps can also illustrate historic road networks and how they relate to individual parcels. As with county tax assessor-collector maps, Tobin maps can assist researchers as they develop chains of title.

Tobin maps, along with historic aerial photographs (*Figure 8-5*), are purchased from P2 Energy Solutions (see link below), which merged with Tobin International (successor to Edgar Tobin’s original company) in 2004. Several format options are available including hard-copy maps, PDFs, and geo-referenced versions; however, they are all copyrighted materials and thus have restrictions on their use and reproduction. A limited number of county historic ownership maps (not produced by Tobin, but similar in features) are available in the map collections of the Texas State Library and Archives (see link below). A sample is provided in *Figure 8-6*. However, they must be geo-referenced to be used in GIS. In contrast, geo-referenced versions of the Tobin maps and aerial photographs can be purchased in a GIS-compatible format and thus are ready for integration into GIS. The TxDOT THO does not include land-ownership cartographic data.

- **P2 Energy Solutions:** <http://www.p2energysolutions.com/tobin-map-data>
- **Texas State Library and Archives:**
<https://www.tsl.state.tx.us/apps/arc/maps/index.php>

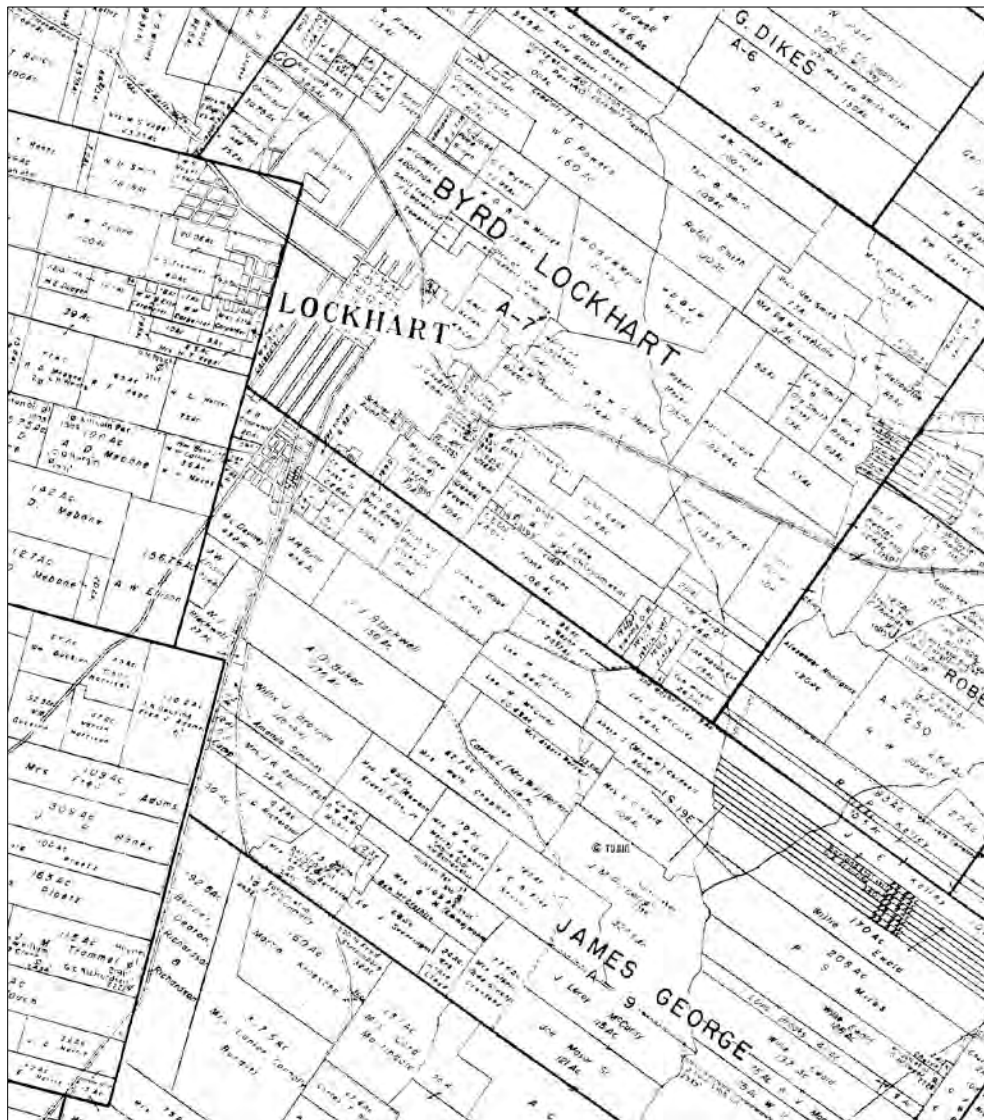


Figure 8-4. Detail of Tobin Lease/Ownership Map, Caldwell County, 1933. The map depicts the size, shape, and owner of parcel, as well as the boundaries of the original land surveys and grants, which are outlined in a heavier line weight; names of the individuals for whom the grants were named (not necessarily the patentees) appear in capitalized bold-faced type. Land ownership maps can reveal or suggest trends and patterns in land use. For example, smaller-sized parcels in rural areas could suggest that the land may have been used for crop cultivation or dairy farming; they also may reflect division of property among family members. Conversely, large parcels are more likely to be used primarily for grazing purposes and to raise livestock. In addition, the orientation of both the original land grants and the parcels within these grants also influenced the road network, as is evidenced in the lower left-hand corner. The dashed line depicts a road extending to Lockhart that largely follows the boundary between three separate land grants. Roads that do not follow grant or parcel boundaries sometimes were the earliest transportation routes and even predated superimposition of a land system. They often followed non-Euro-American trails and were more dependent on topographic conditions. In other cases, such roads are more current superimpositions of highways that follow direct paths and may ignore historic settlement and land-use patterns.



Figure 8-5. Historic Aerial Photograph, 1937 acquired from P2 Energy Solutions. This aerial depicts conditions along US 183 in the present-day Leander area of Williamson County (the community of Leander appears at the bottom-center of the photograph). Most of the land in the bottom (southern) half of the image consists of cultivated fields. In contrast, areas in the upper (northern) half show unimproved land that likely was used for grazing purposes.

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- **Cemeteries**
- **Churches**
- **Windmills**
- **Water features (ponds, lakes, rivers, streams)**
- **Bridges**
- **Dams**
- **Cattle guard gates**
- **Oil fields**

General highway maps are important resources for understanding how road networks have evolved over time. By comparing a county's transportation infrastructure beginning in 1936 to subsequent decades, a user can identify key economic, settlement, and agricultural trends. For example, a concentration of roads in one area of a county might indicate increased economic or settlement activity. An additional feature of general highway maps useful to researchers interested in agricultural history is the presence of agricultural dwellings and infrastructure.

The historic county highway maps are located at the Texas State Library and Archives Commission in Austin and are also available online.

- **Texas State Library and Archives Commission:**
<https://www.tsl.state.tx.us/apps/arc/maps/>

Although they are not in the THO and are not geo-referenced for immediate integration into GIS, they nonetheless are a valuable data set that can be used to understand the evolution of the road network in a county and how it responded to the transportation, commercial, and agricultural needs of local residents.

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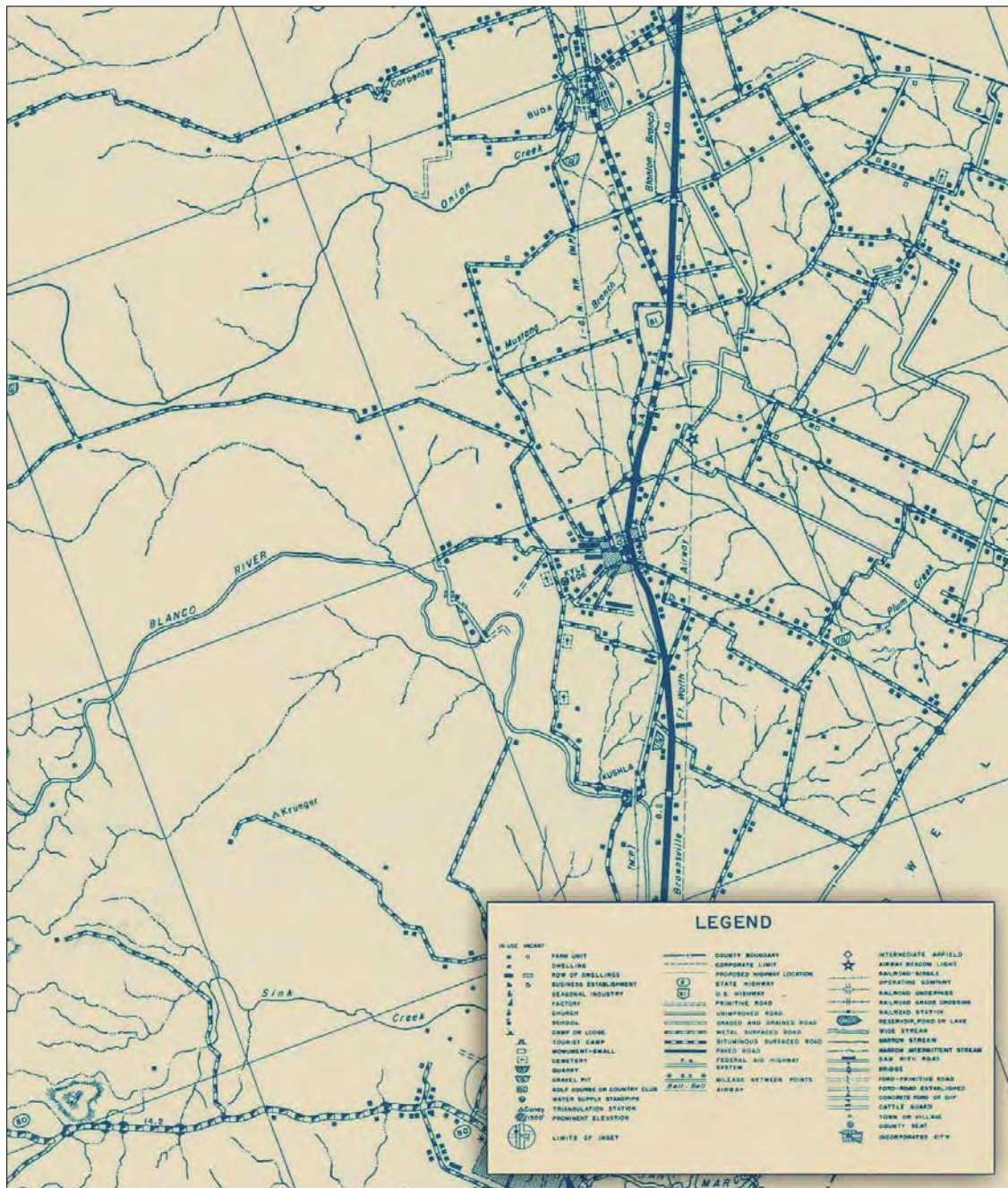


Figure 8-7. Detail of General Highway Map, Hays County, 1936 (updated 1940). The meandering path of many of the roadways west of US 81 is likely a response to an irregular topography. In areas where the road network presents a more grid-like quality east of US 81, the route reflects a common trend in which roads followed property lines. Land where a grid-like pattern exists, such as on the right-hand side of this figure, very likely was used more extensively for farming, though additional research would be necessary to confirm such a supposition. Nonetheless, the road network often reflects historic land and settlement patterns. Also, note the legend inset, which identifies the types of cultural features depicted on the map.

U.S. Geological Survey Topographic Maps

Historic U.S. Geological Survey (USGS) topographic maps (*Figures 8-8 and 8-9*) are great resources that can benefit evaluations of agricultural resources and landscapes. The maps range in date from the late 1800s to the early 2000s, and often include multiple date ranges for the same area. The maps include a variety of useful features, some of which are only included on maps prior to 1945:

- **Road networks**
- **Railroads**
- **Cemeteries**
- **Buildings (dwellings, outbuildings, etc.)**
- **Windmills, pumps, wells**
- **Land use**
- **Ranches and farms**
- **Businesses and institutions (such as churches and schools)**
- **Fences**
- **Topographic information (elevations, etc.)**
- **Natural features (rivers, vegetation, etc.)**
- **Power transmission lines**
- **Quarries**

Because of the wide array of features presented in USGS maps (in particular, those dated prior to 1945), they are excellent resources for understanding an agricultural resource or property. A user interested in understanding more about a specific resource can identify key patterns of development using USGS maps. For example, by noting the location of a community school or a church near a project area, a user can assume that the area was part of a rural settlement location, as schools and churches were often centrally located. In addition, the presence of a road network near a project area might indicate a central role that transportation played in early settlement.

Historic Texas USGS maps are located at the Perry-Castañeda Library Map Collection at The University of Texas in Austin, Texas. The maps have also been digitally scanned and are available online.

- The Perry-Castañeda Library Map Collection:
<http://www.lib.utexas.edu/maps/topo/texas/b.html>

While the USGS map collection at the Perry-Castañeda Library is available to the public online, the TxDOT THO system contains a more extensive collection of historic USGS maps that are geo-referenced and ready to use for specific project locations.

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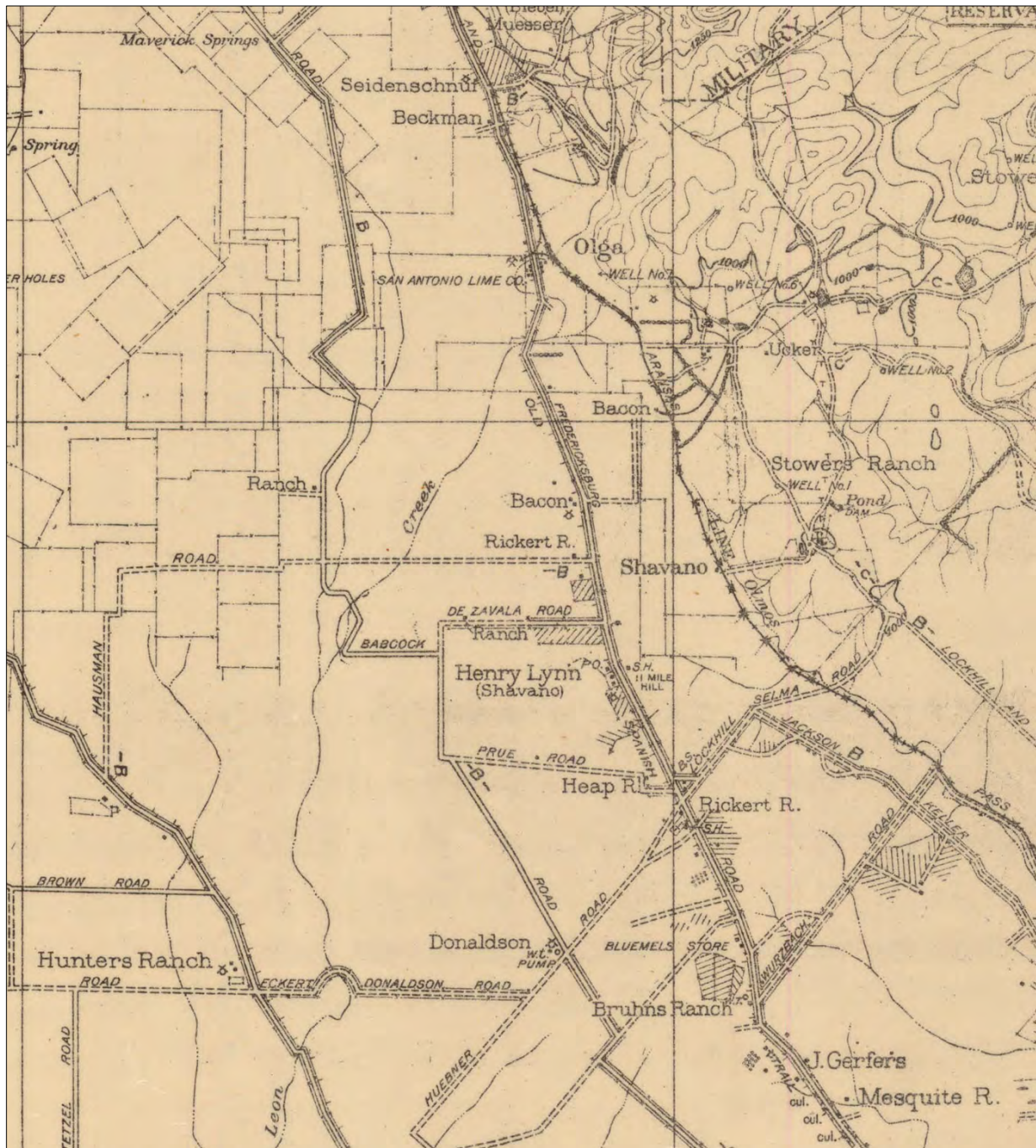


Figure 8-8. Detail of Preliminary USGS Map, Leon Springs, Bexar County, 1925. Maps such as the one above fulfilled an important military need at the time of their publication and note natural and cultural landmarks. This example covers an area near Camp Bullis in northwest Bexar County. The lack of contour lines and minimal amounts of land-use depictions (cultivated/improved fields are noted by hatch marks) limits the user's ability to discern how the land was used.

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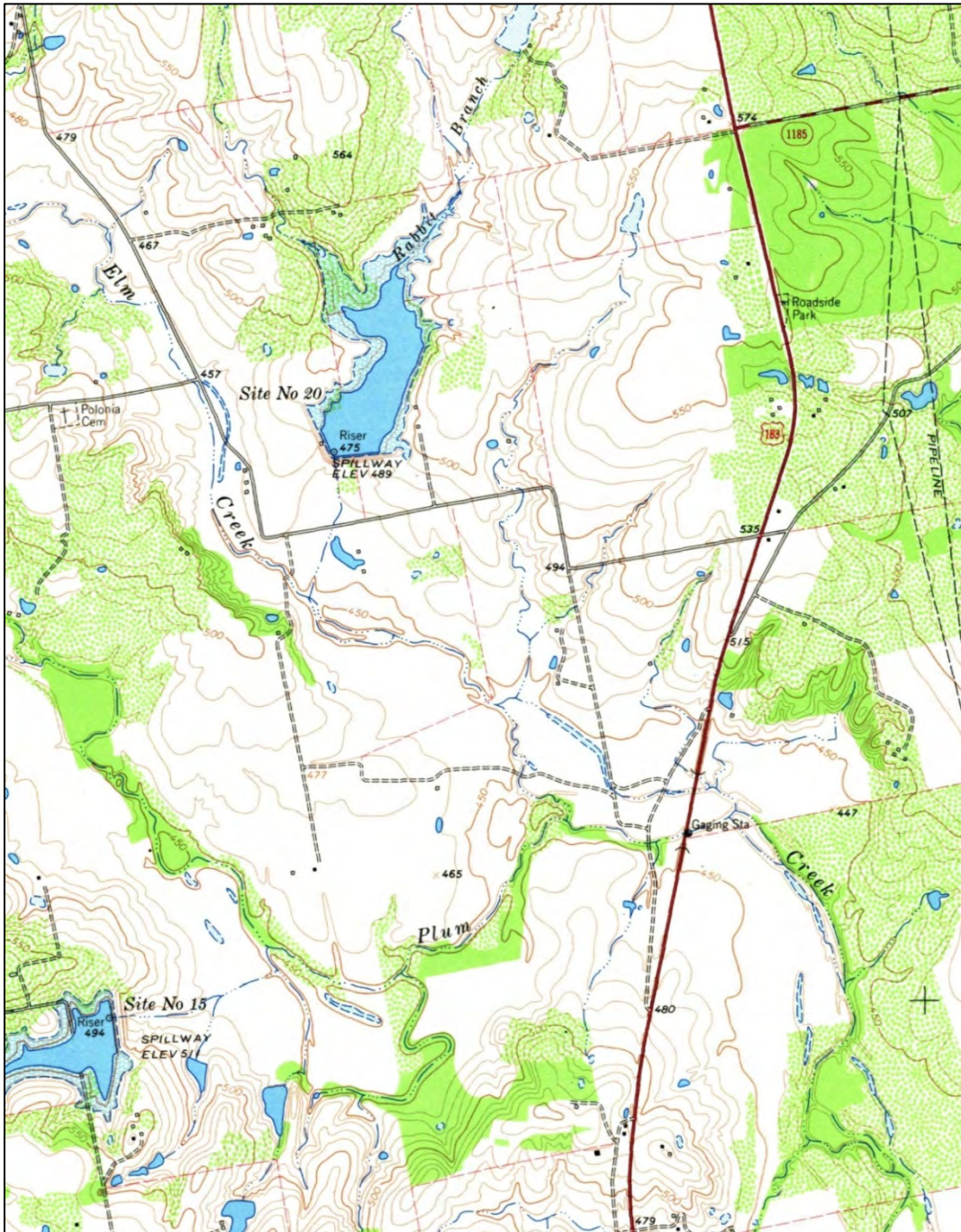


Figure 8-9. Detail of Lockhart North, Texas Quadrangle, 1963. USGS maps published in this time period are particularly useful for evaluating agricultural properties because of the detailed information they depict. The information presents a good baseline data set that can be used to document changes that have been completed since the map was published and how these changes affect the historic character and integrity of agricultural properties and associated landscapes. In contrast to the USGS map in the previous figure, this map indicates contour lines and uses color to indicate open field and prairies as well as forested areas.

Aerial Photographs

In addition to maps, aerial photographs can be extremely helpful to agricultural resource evaluations (*Figures 8-10, 8-11, and 8-12*). Aerial photographic coverage varies, but can range from the 1930s to the present day. The photographs can show a variety of features that are useful for understanding and evaluating agricultural properties including:

- **Transportation networks**
- **Settlement patterns**
- **Building complexes**
- **Vegetation and field patterns, including modifications to topography**
- **Water sources**

Given a varied date range of aerial photographs, researchers can identify key patterns through comparison. For example, aerial photographs can show how road networks evolved over time and document how non-agricultural development may have altered historic agricultural-based landscapes. With sufficient clarity and resolution, photographs can also reveal the historic presence of agricultural resources and features, such as soil contouring, fencing, buildings and structures, orchards, irrigation systems, and tanks. (For more information about resource types, see Section 5, Property Type Development.) They can aid efforts to roughly date specific features. While aerial photographs are most useful comparatively, they can provide needed clues about a site or agricultural and settlement activities in a region.

Historic aerials can be purchased at the Texas Natural Resources Information System (TNRIS). In addition, Historic Aerials is an online source for historic aerial photographs, and the company provides wide coverage throughout the study area (see links below). The website also includes an interactive graphic interface that allows users to view two different sets of historic aerials and/or maps and compare with a sliding ruler. Historical aerials from these and other sources are especially useful as they can be viewed chronologically depending on map coverage, thus enabling researchers the ability to track how a particular property changed or remained the same over time. Through its Earth Explorer website, USGS also provides another online source for aerial photographs. Other online sources for aerial photographs include Google Maps, Google Earth (free installation), and Bing Maps.

- **TNRIS online:** <http://www.tnris.org/>
- **Historic Aerials:** <http://www.historicaerials.com/>
- **USGS Earth Explorer:** <http://earthexplorer.usgs.gov/>
- **Google Maps:** <https://maps.google.com/>

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- Google Earth (download link):
http://www.google.com/earth/index.html#utm_campaign=en&utm_medium=ha&utm_source=en-ha-na-us-sk-eargen&utm_term=earth
- Bing Maps: <http://www.bing.com/maps/>



Figure 8-10. Detail of Aerial Photograph, Williamson County, 1941, from the TNRIS Collection. The image is cropped from an aerial index that shows aerial photo coverage for western Williamson County. The resolution is not particularly effective for detailed analysis, but better-quality images of smaller areas are available. Nonetheless, the image presents graphic evidence of broad land-use patterns and the road network. The lack of a scale, any landmarks, or any other geo-reference information limit the usefulness of the image; however, used as part of an overlay with other maps in a GIS-based file, the map becomes a more effective tool for understanding historical agricultural traditions in the area.

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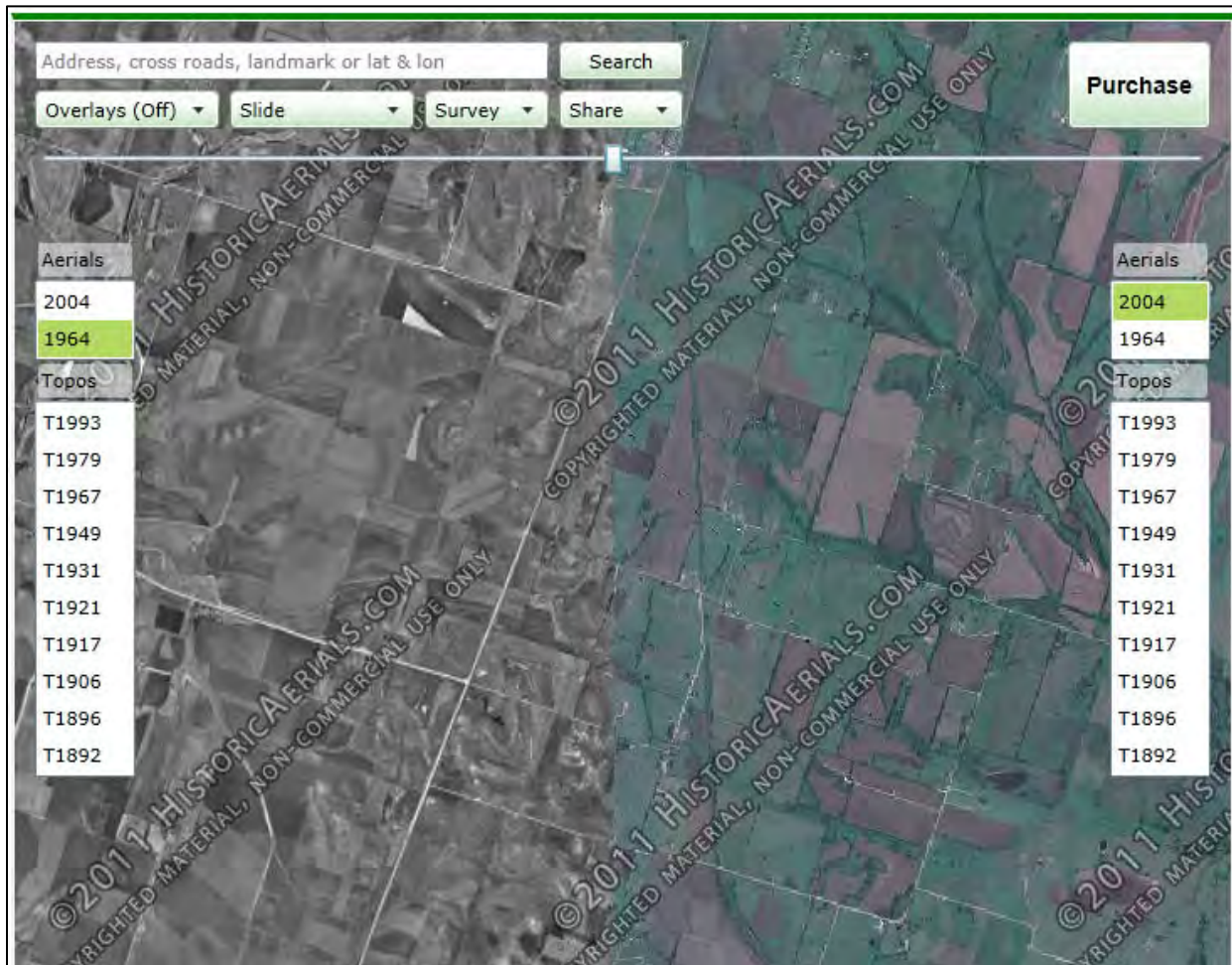


Figure 8-11. Screen Capture from www.historicaerials.com. This screen capture shows a rural area near the boundary between Bell and McLennan Counties. The website provides interactive and overlaying capabilities that are user friendly and an effective means to compare geographic areas when historic aerials are available. This screen capture shows conditions in 1964 (left) and 2004 (right). The horizontal bar near the top of the photo can be used to “slide” the point where the images meet and can be an effective tool for comparative analyses. This interactive tool can show how changes have occurred over time.

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Figure 8-12. Screen Captures from Bing Maps. This set of images showcases Bing's bird's-eye view feature that can be very useful for documenting and assessing agricultural properties. This graphic shows a ca. 1920 Craftsman bungalow and associated outbuildings and land along a stretch of SH 123 south of Geronimo from four different perspectives. Each of the four images has sufficient clarity and resolution to discern the tilled fields on land surrounding the house and outbuildings. Bing also includes the ability to zoom in and out by using the plus and minus sign (+, -) at the upper right-hand corner of the interface. The website also allows views from different perspectives by clicking the arrows around the compass figure at the top right-hand corner of the interface. Bing's bird's-eye views are particularly useful for documenting agricultural properties that have built resources that are placed away from public roads and are not visible from public roads, or when right of entry has not been granted.

Stoner Ownership Maps and Aerial Photographs (Bexar County only)

Created for Bexar County tax purposes in 1938 by J. Ben Stoner, the Stoner system provides useful historical information for Bexar County. The county is separated into smaller quadrants, each of which includes an accompanying aerial photograph (*Figures 8-13 and 8-14*). They are similar to the kinds of maps published by Edgar Tobin Aerial Surveys, which are described earlier, but they are produced at a smaller scale and thus display more detailed information. The Stoner maps include the following information:

- Legal boundaries including dimensions of parcels (in *varas*)
- County lines
- Property ownership recorded at time of mapping (name, acreage)
- Roads and road names
- Dwellings, outbuildings, and building clusters
- Cemeteries
- Churches

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- **Water features**
- **Dairies**
- **Fences**

While limited to 1938, the maps are especially useful for documenting individual land parcels and how they have changed over time when compared with aerial photos and other cartographic data. The inclusion of associated aerial photographs used to generate each map makes Stoner map data especially useful, although the quality of the resolution and the lack of clarity of the aerials can diminish their effectiveness. Like Tobin ownership maps, Stoner maps provide a good data set that can be used to document how a property has evolved because they illustrate internal circulation networks on a parcel, depict building clusters relative to roads and drives, and show concentrations and density of settlement in a relatively small geographic area at a specific time. In addition, the associated aerial photographs provide visual cues such as soil contouring, fencing, buildings and structures, and irrigation systems.

Stoner maps are currently available at the Bexar County Public Works Department. Since they are not part of TxDOT THO, the Stoner ownership maps are not geo-referenced and will require additional time to make them usable for GIS purposes. They are, nonetheless, a very useful research and analysis tool for researchers undertaking projects in Bexar County.

- **Bexar County Public Works Department:**
233 N. Pecos, Suite 420
San Antonio, Texas
Phone: 210-335-6700
<http://inf.bexar.org/>

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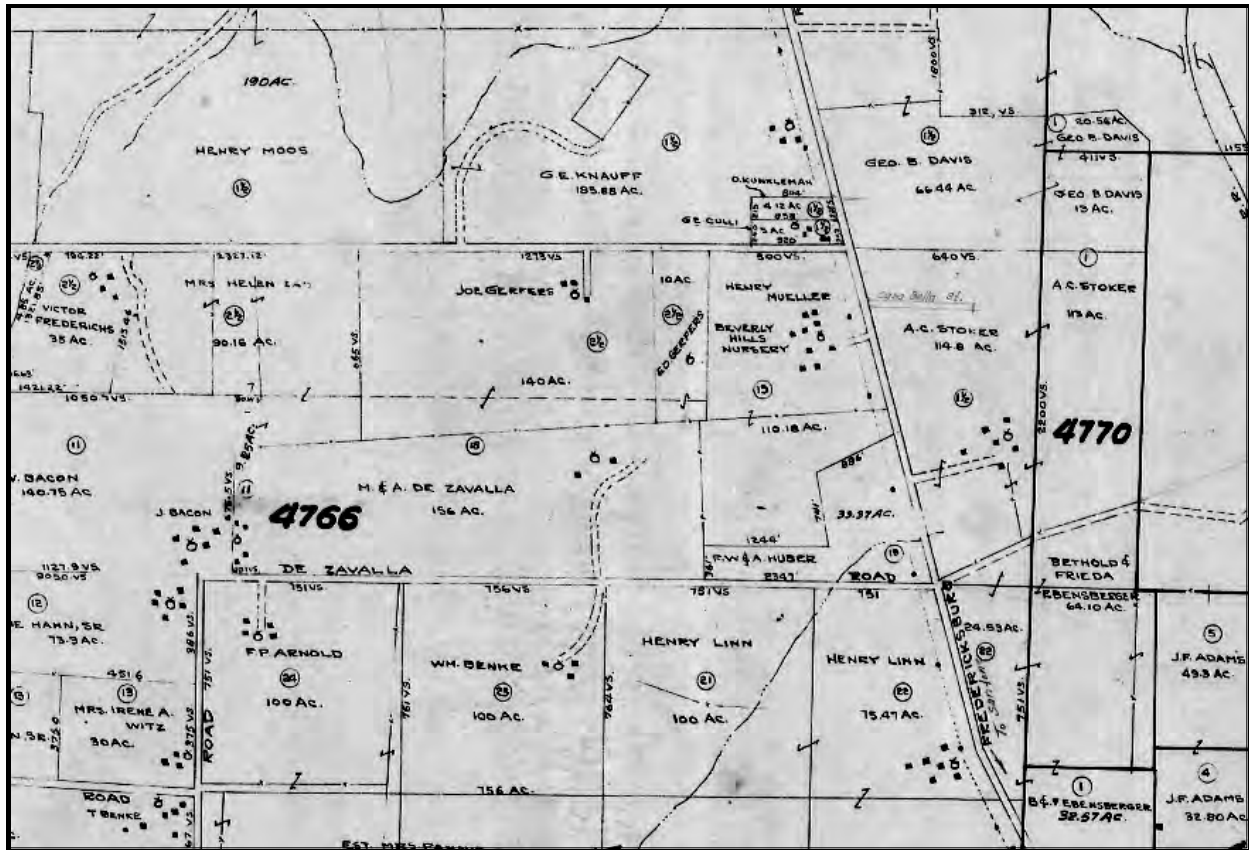


Figure 8-13. Detail of Stoner Map, Bexar County, 1938. The map delineates the boundaries of parcels at that time. The numbers in bold are believed to be part of the county's tax identification coding system and are likely used in combination with the circled number in each parcel to identify each tract of land. The "Z-like" symbols show continuation of ownership across property lines. The map shows the existing road network, identifies property owners, and plots the location of buildings on each property. The detailed information is valuable for understanding conditions in rural areas throughout Bexar County in 1938.



Figure 8-14. Aerial Photograph from Stoner Files. This image covers the same area depicted in the previous figure. The two images present a significant amount of information about ownership, improvements (roads, buildings, etc.), and land use in this part of Bexar County. Such data provide a useful tool for evaluating conditions during the last years of the Great Depression and can be used to assess the degree to which the same rural area still retains its historic character and integrity. The resolution of these images is relatively poor but they are of sufficient quality to note general landscape patterns.

Soil Survey Maps

Historic soil survey maps are resources that can benefit evaluations of agricultural resources and landscapes (*Figure 8-15*). The maps range in date from the early-twentieth century to today, and usually include multiple date ranges for the same area. In addition to the actual map, soil surveys include a textual report, which provides useful information describing soil types and their uses, climate information, and summaries of agricultural activities and identifications of crops and livestock appropriate to each soil type. The maps include a variety of useful features:

- **Soil types**
- **Water features**
- **Ranches**

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- **Highways and other roads**
- **Railroads**
- **Dwellings**
- **Schools**
- **Churches**
- **Communities**
- **Cemeteries**
- **Bridges**

Because of the wide array of features presented in soil survey maps, they are excellent resources for understanding an agricultural resource or property and its relationship to soil types and agricultural patterns. In some ways similar to historic USGS maps, soil survey maps note the location of dwellings, schools, cemeteries, and other important features, which can aid researcher's attempts to understand how an area developed. In addition, the inclusion of transportation features in the maps can indicate the role transportation played in early settlement.

A full inventory of soil surveys for Texas counties can be found at the U.S. Department of Agriculture, Natural Resources Conservation Service. Some historic soil survey maps can be found at the Texas State Library and Archives Commission in Austin, and a good number of the early soil maps are also available as part of the TxDOT THO system. Those that are part of the system are geo-referenced and ready to use for specific project locations. The Portal to Texas History also includes digitized copies of soil maps.

- **USDA, Natural Resources Conservation Service:**
http://soils.usda.gov/survey/printed_surveys/state.asp?state=Texas&abbr=TX
- **Texas State Library and Archives Commission:**
<https://www.tsl.state.tx.us/apps/arc/maps/>
- **The Portal to Texas History:**
<http://texashistory.unt.edu/>

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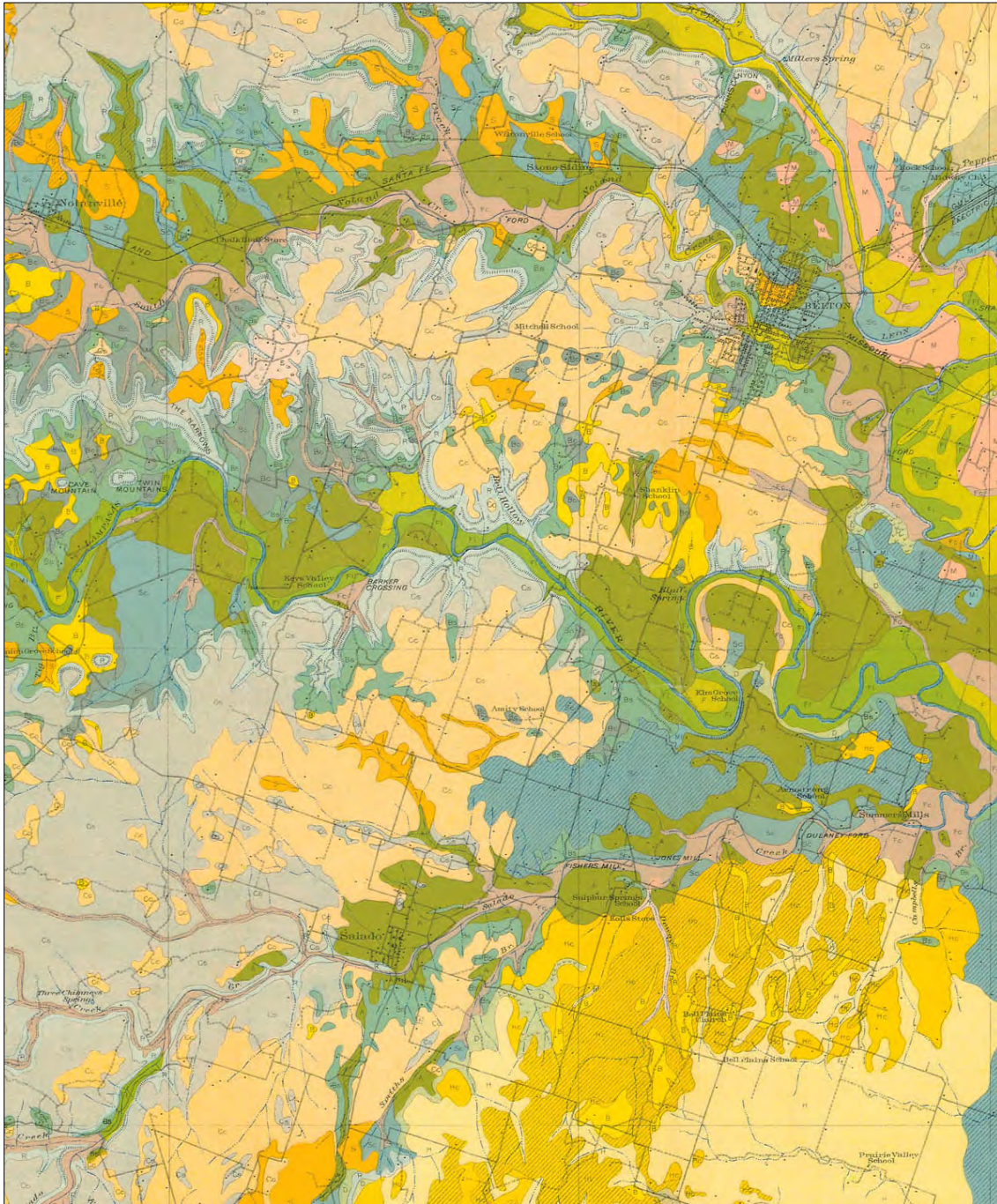


Figure 8-15. Detail of Soil Survey Map, Bell County, 1916. Soil types play a fundamental role in understanding what kind of agricultural activities are more likely to take place in any locale. For example, dark green areas along the Brazos River are classified as “Abilene Clay.” The accompanying soil survey report notes that this soil type is “especially suited for cotton,” which was an important local cash crop at the time. Historic soil survey maps are also useful because they note cultural features, such as roads, residences, schools, churches, etc., and provide a graphic depiction of settlement patterns.

ANALYSIS

GIS-Based Map Analysis

GIS is a powerful tool that historians, architectural historians, archeologists, cultural geographers, and cartographers alike can use to better understand the past. It has direct application for cultural resource management surveys that identify, document, and assess historic properties that may be affected by transportation undertakings. GIS relies on geo-referenced maps and aerial photographs from one or more time periods that can be combined to identify cultural features and land-use patterns within a clearly defined area or along an existing or planned transportation corridor. The layering capabilities of GIS-based cartographic data can graphically depict important trends and patterns over time that can confirm, supplement, or modify information gleaned through other research, especially for agricultural properties in rural settings. (For detailed information about researching agricultural properties, see Section 2, Research Guide and Methodology.)

At another level, GIS map analysis illustrates an approach that cultural resource management professionals should always take into account while identifying, documenting, and assessing historic properties: the layering of history. (See Section 4, Historic Context for information about the layering of agricultural history in Texas.) GIS provides graphic depictions of geographic areas at macro and micro levels that underscore the dynamic and ever-changing character of agricultural properties and associated landscapes. Market conditions, government policies, weather, and transportation networks are among the many factors that are subject to constant change and evolution and thus affect land use and patterns in rural areas. While National Park Service (NPS) standards establish rigid and often arbitrary parameters (50-year age threshold for NRHP eligibility and periods of significance) to evaluate historic properties, GIS has the ability to demonstrate how landscapes are constantly changing and how they reflect or respond to a myriad of forces, both cultural and natural. It must be understood that the maps and aerial photos used for GIS analysis merely capture particular moments in time. Only by comparing and analyzing these materials from different periods of time can historians begin to understand the number, degree, and severity of changes manifested in the landscape. In addition, GIS analysis must be supplemented with research that can confirm, supplement, and augment trends noted on GIS-generated maps. Furthermore, local residents and others knowledgeable about the history of a geographic area can provide information that complements GIS-based analysis. These individuals often have keen insights into land-use patterns and the history of an area that may explain, clarify, and modify ideas about trends and patterns noted through GIS analysis. (See Section 3, Fieldwork Guide and Methodology for a list of local contacts that may provide helpful information.)

The previous section identified some of the important materials and repositories that can be used for GIS map analysis. Clearly, TxDOT's own THO represents the most significant source of cartographic materials for GIS because the maps are already geo-referenced, their coverage extends over the entire Central Texas region, and the maps span a broad time period. Historic USGS quadrangle maps included

in the THO are particularly useful because a large number of maps extending over the region were updated between the late 1950s and the early 1970s. This time span includes the survey cut-off dates currently used for non-archeological historic resources. As such, the maps present a useful baseline data set that can be used to identify resource locations through map analysis and to direct efforts for subsequent research. General highway maps also are useful but are not as accurate and comprehensive as the historic topographic quadrangle maps.

GIS as an Aid for Developing Historic Contexts

The application of GIS-generated maps can be helpful for the preparation of historic contexts because: 1) they can confirm trends noted in the course of performing conventional, text-based research, and 2) they can help focus subsequent and more in-depth research and investigations. (See Section 2, Research Guide and Methodology for guidance on completing historical research.) The kinds of maps often used for such purposes typically are at a macro level and extend over a single- or multi-county area. These maps are beneficial primarily for comparative purposes rather than for the details they illustrate at a specific resource location.

For example, *Figure 8-16* presents information extracted from a map using census data compiled by noted Texas cultural geographer, Terry Jordan, in his book *Population Origin Groups in Rural Texas*. The map shows concentrations of peoples of various ethnic heritages and backgrounds in rural areas throughout the state, as noted. *Figure 8-16* presents a macro-level view of the region, but when used in combination with other geo-referenced materials will suggest settlement factors in Central Texas. The combination of a base map (in this instance, Jordan's map) with other cartographic materials (counties and roads) also presents a good starting point for understanding historic agricultural patterns and traditions in the region. Clearly, methods and agricultural practices changed over time, but land use and even the built environment may exhibit qualities that reflect the heritage and background of original settlers.

Figure 8-17 shows areas of prime farmland within the 13-county region targeted for study in this report. The map includes data from the U.S. Department of Agriculture (USDA) and includes overlays of political boundaries (county lines), rivers, and major routes in the regional road network. This graphic shows where farming is concentrated in the region and will be useful for predicting the kinds of resources that are likely to be encountered during field investigations.

Another illustration of a macro-level GIS map (*Figure 8-18*) examines the number of farms throughout the Central Texas Region from 1890 to 1950. This 60-year span covers an important era in the region's history when improved transportation, increased usage of mechanized agricultural implements, advances in agricultural practices, changes in government policy, demographic shifts, changing market forces, impacts of long-term soil erosion, and other factors affected the sizes and numbers of farms over time. This image reveals widespread trends that convey a broad overview and quantifies, or even modifies data about, trends that may be noted in general published histories. Using this information,

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historians can note regional patterns and how they are reflected in smaller areas and locations throughout the Central Texas region.

Information gleaned from macro-level maps (such as *Figures 8-16, 8-17, and 8-18*) can direct research efforts for the preparation of a historic context. They may reveal important trends in local history and/or confirm themes noted, for example, in a Research Design for a historic resources survey. Moreover, these maps also may be useful for anticipating the kinds of resources that may be identified and documented during field investigations, as the built environment and associated landscape represent physical links to the historic trends and themes discussed in the context. (Note that an overview of farming, dairying, and ranching is included in Section 4, Historic Context.)

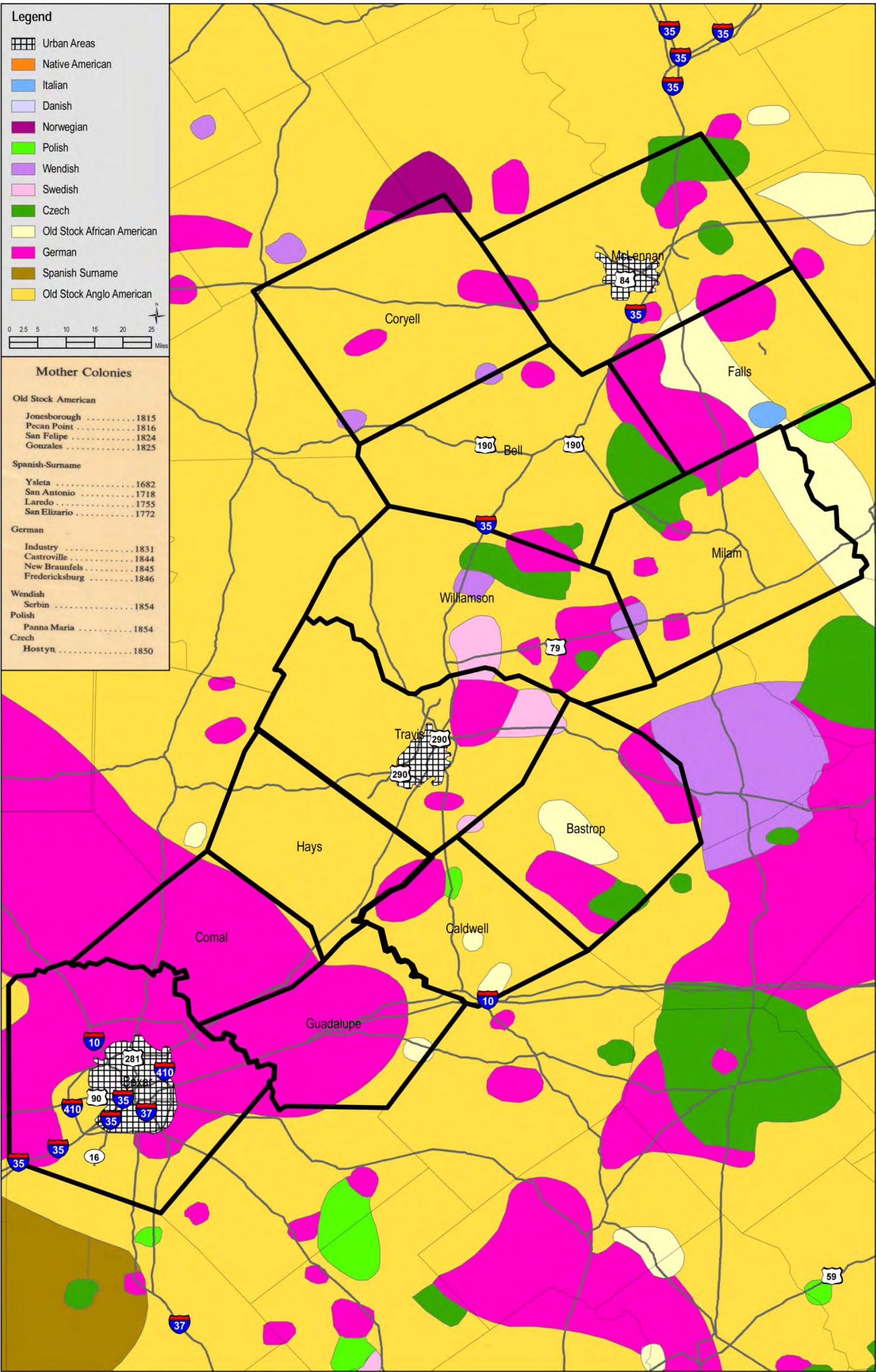


Figure 8-16. Historic Ethnic Concentrations in the Central Texas Region. This GIS overlay shows current political boundaries with historic nodes of ethnic groups in the area. The agricultural traditions and practices these groups brought influenced land-use development patterns, many of which have endured over the years. The image shows the prevalence of the “Old Stock Anglo Americans” who emigrated primarily from the Upland and Lowland South. The area also contains significant concentrations of German and Czech immigrants. Note the significant concentrations of “Old Stock African Americans” along the Brazos and portions of the Colorado and Guadalupe rivers.

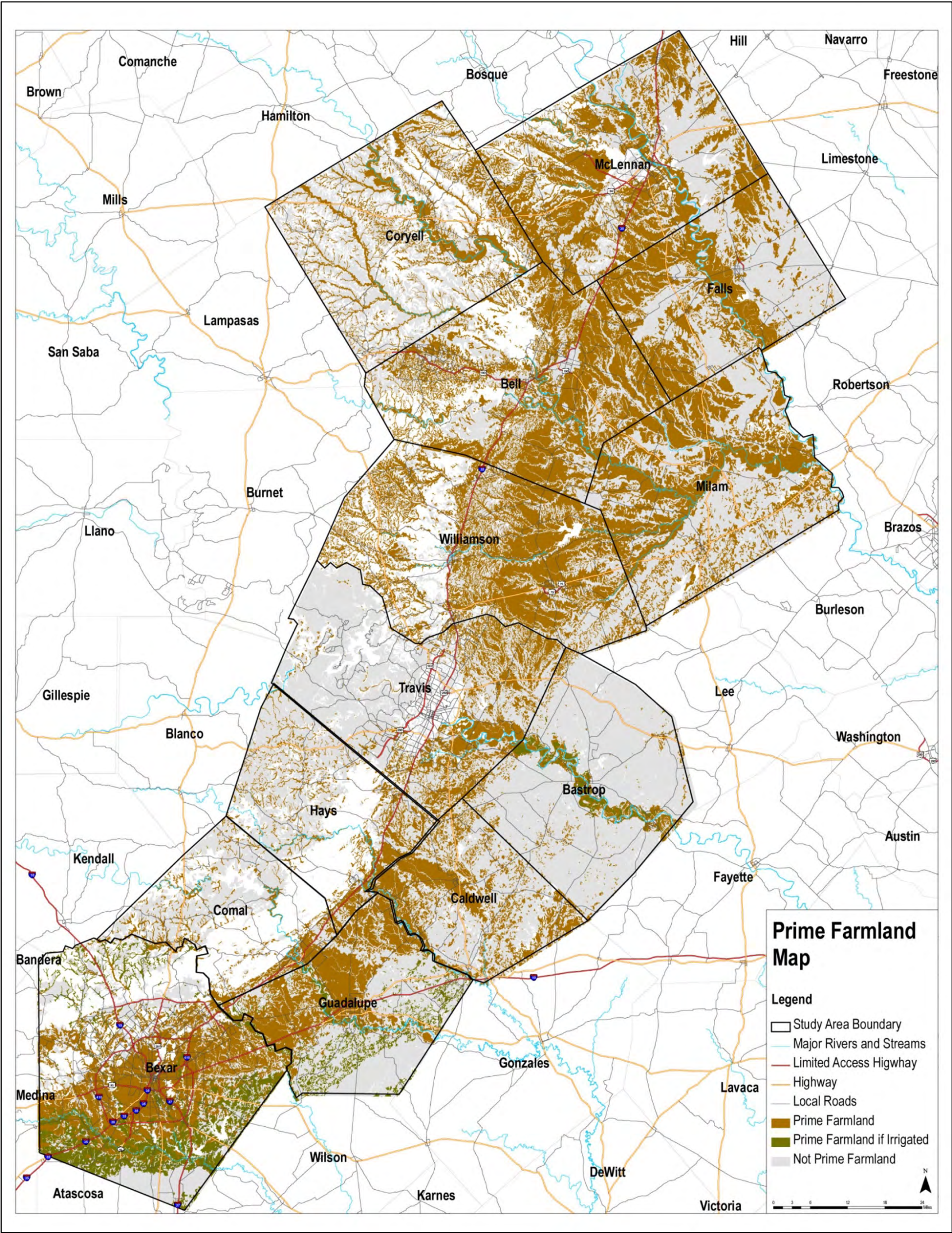


Figure 8-17. Prime Farmland in Central Texas Region. This map shows the region's best farmland. The U.S. Department of Agriculture provides this GIS-based information, and it illustrates areas where prime farmland is located with and without irrigation. This figure illustrates that the best farmlands are largely concentrated along major rivers and east of the IH 35 corridor, which generally follows the Balcones Escarpment. As a result, land in the eastern section of the project area with prime farmland was conducive for crop cultivation and historically attracted a greater percentage of farmers than the other parts of the project area. Conversely, the quality of the soil and the characteristics of the land west of the Balcones Escarpment generally proved to be better suited for raising livestock. However, both types of agricultural activities took place in all regions. As with many general trends, the information presented in this figure is corroborated by information gathered through historical research. Such information can aid the researcher to anticipate the types of agricultural resources that may be in a particular locale.

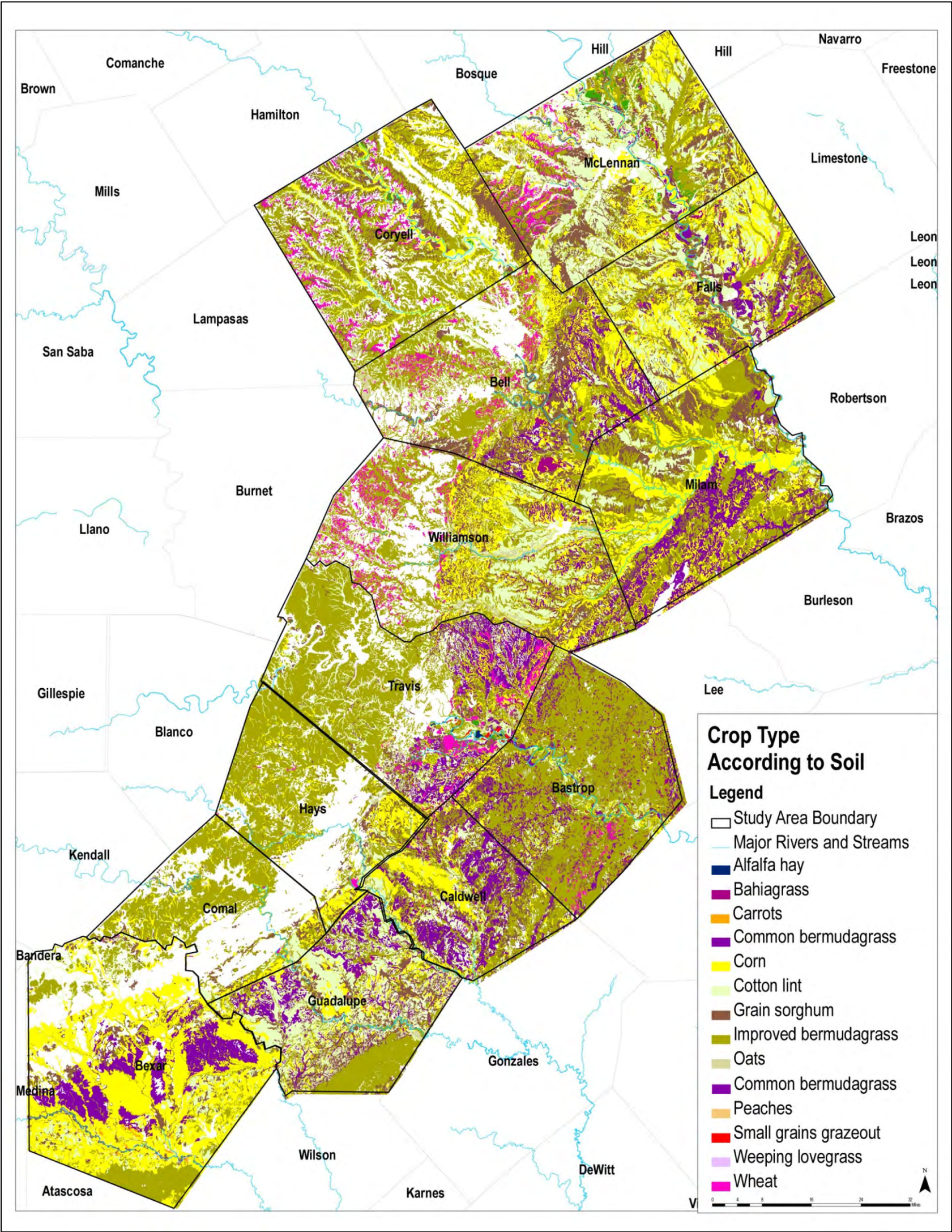


Figure 8-18. Concentrations of Crop Types in Central Texas Region. The map shows noteworthy concentrations of crops grown in the 13-county study area. Compiled from the U.S. Department of Agriculture GIS data, the map provides an insightful glimpse into current land-use and agricultural patterns. Maps such as this one can also be used to anticipate the kinds of resources likely to be found in a rural setting during field investigations for a transportation undertaking.

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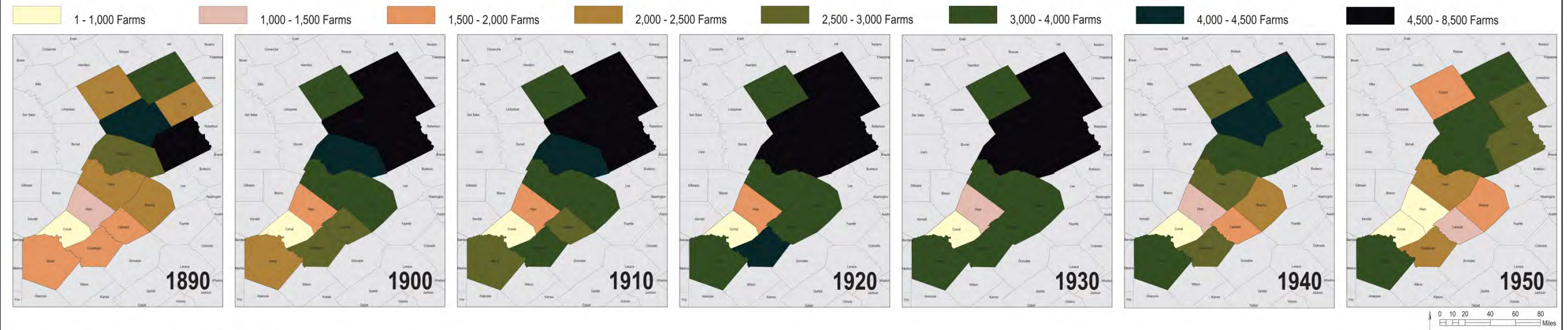
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With layering capabilities, GIS offers opportunities to create other kinds of maps that present historical information graphically and can be useful for understanding broad patterns in local history. For example, *Figure 8-19* combines county-wide agricultural census data from census schedules into an information graphic that shows the dynamic character of farm sizes throughout the study area over a 60-year period. This figure provides a starting point that can direct research efforts to explore factors that contributed to trends depicted in the series of maps. In addition, the series of tables beneath the maps provide data that can be used to understand the sizes of farms relative to each county within the study area.

Additional examples of combinations of different data sets are presented as follows:

- ***Figure 8-20.* Overlay for Bastrop County with 1907 U.S. Department of Agriculture Soil Map and Terry Jordan's "Population Origin Groups in Rural Texas," which appeared in the *Annals of the Association of American Geographers*, Vol. 60, No. 2 (Jun., 1970), pp. 404-405.**
- ***Figure 8-21.* Analysis Map of Caldwell County Showing 1940 Farm Units within Currently Crop-Covered Areas.**
- ***Figure 8-22.* Evolution of Major Roadways and Road Network in Caldwell County Relative to Land Parcels.**
- ***Figure 8-23.* Map of Guadalupe County Showing 1940 Buildings, Structures and Sites within Currently Crop-Covered Areas.**
- ***Figure 8-24.* Overlay with Sectional Map of Texas Traversed by the Missouri, Kansas & Texas Railway (1909) and Size of Farms in Study Area Counties for 1910.**

Number of Farms in Study Area Counties



Size of Farms in Study Area Counties

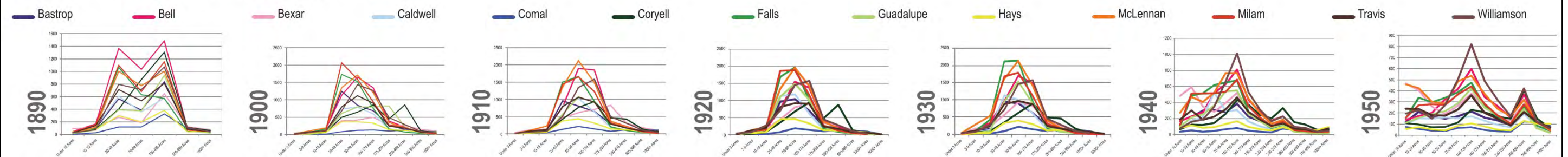


Figure 8-19. Historical Trends in Number of Farms in Central Texas Region. This figure depicts the dynamic character of the number of farms in the study area during the first decades of the twentieth century. Counties to the north and east contain higher percentages of land within the Blackland Prairie Belt, which was particularly conducive for cotton cultivation. Those counties with significant acreage west of the Blackland Prairie belt show a smaller number of farms, which seems to suggest that ranching may have been more prevalent in the western half of the study area over this span of time.

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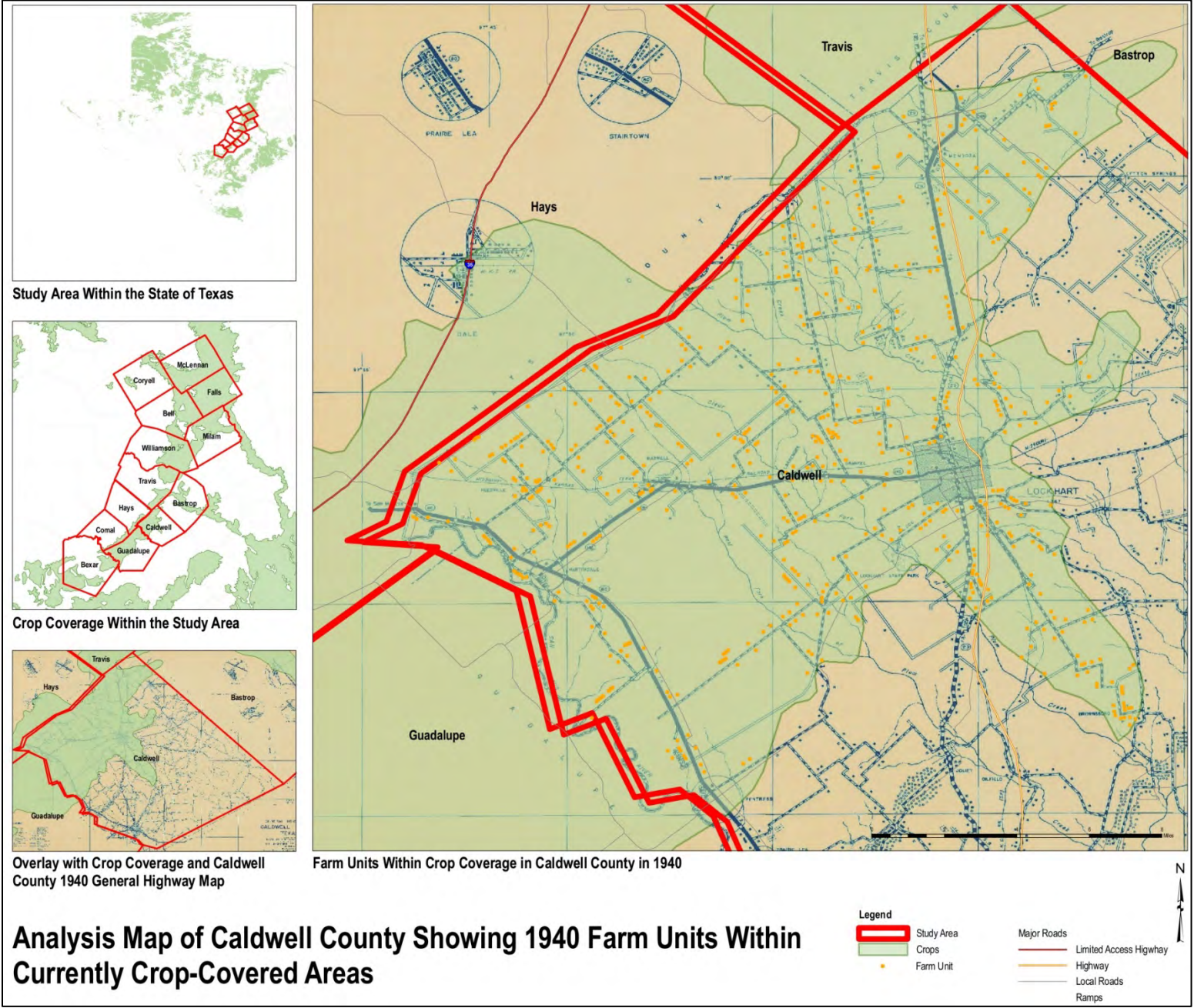


Figure 8-21. Analysis Map of Caldwell County Showing 1940 Farm Units within Currently Crop-Covered Areas. In this map the following data sets are combined: farm units in Caldwell County derived from digitizing components of a 1940 general highway map and crop coverage across Caldwell County, which was ascertained from USDA soil-survey data. The first step in producing this map involved the manipulation of the USDA soil data to create a shape file revealing the distribution of crop-covered areas across the county. Then, the farm units layer was produced by adding the 1940 general highway map to ArcMap and tracing over the points representing farm units, thereby creating a “digitized” file, or vector graphics, that then could be overlaid with any data. For this map, a choice was made to only focus on the farm units located in crop-covered sections of the county. The aim was to understand where concentrations of agricultural buildings might occur. Theoretically, this information could then be used to help identify specific areas upon which to focus for closer study. However, this particular overlay did not reveal information not already apparent before analyzing the map. It is not surprising to find that the most obvious pattern seen in the overlay is the clustering of farm units around roads. The clustering of farm units around roads is the drawback of using the general highway maps—they don’t depict improvements that are adjacent to roads. Researchers must be careful to use aerials to correct this bias and be alert in the field to the potential for improvements that do not appear on general highway maps.

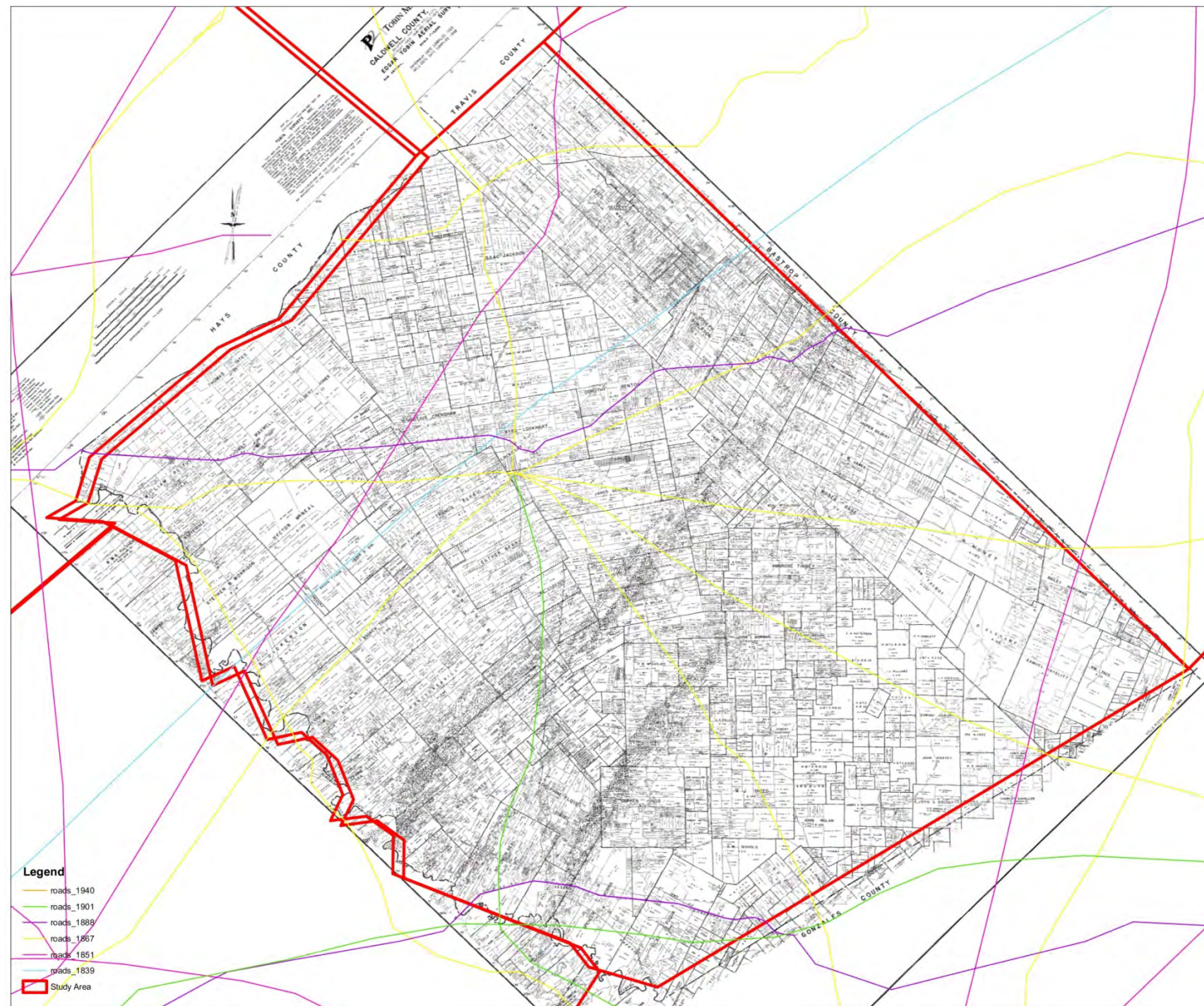


Figure 8-22. Evolution of Major Roadways and Road Network in Caldwell County Relative to Land Parcels. The map includes a Tobin map as the background, showing land ownership. The lines traversing the county represent roads that developed at different periods of time, their colors indicating their dates of construction. This “historic roads” shape file resulted from tracing road networks depicted on various historic maps included in the THO Collection. The objective in creating this map was to illustrate the development of road networks in Caldwell County over time and understand how the roads relate to the original land grants. Although the alignment of the roads does not appear to be precise in the overlay due to unavoidable geo-referencing issues, one can discern how the road networks were shaped by the land parcels.

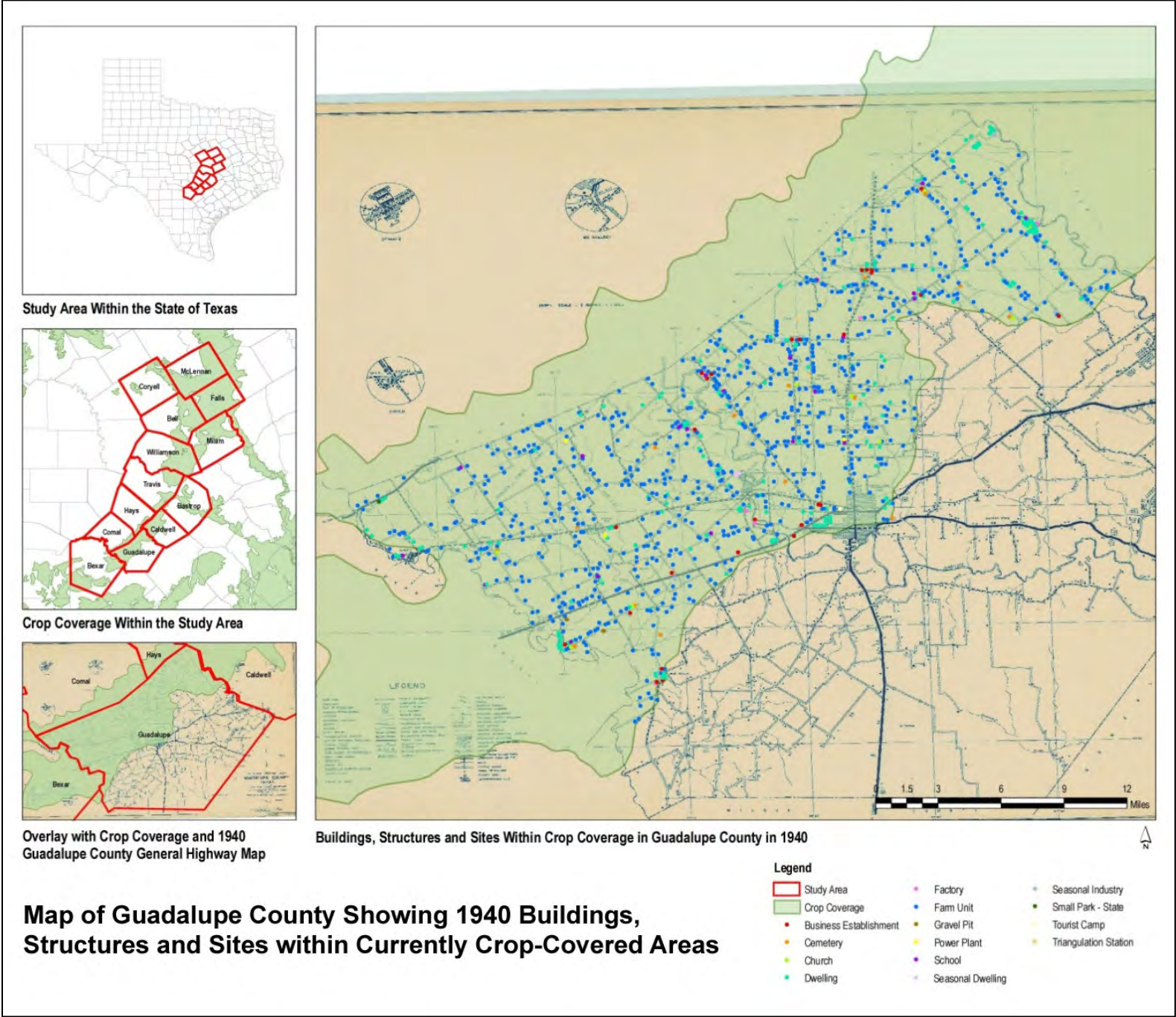


Figure 8-23. Map of Guadalupe County Showing 1940 Buildings, Structure, and Sites within Currently Crop-Covered Areas. This map is very similar to Figure 8-21, relying on the same methodology in its creation. In this map of Guadalupe County, the following data sets are combined: structure types in Guadalupe County derived from digitizing components of a 1940 general highway map and crop coverage across Guadalupe County, which was ascertained from USDA soil-survey data. As with the Caldwell County map, the first step in producing this overlay involved the manipulation of the USDA soil data to create a shape file revealing the distribution of crop-covered areas across the county. To create the structure types layer, the 1940 general highway map of Guadalupe County was added to ArcMap. (See Figure 8-21 caption for problems associated with using general highway maps.) Then the different structures occupying the area with crop coverage were traced, resulting in a “digitized” file, or vector graphics, that could be overlaid with any data. The different-colored points represent the various structure types evident on the general highway map. The intention of showing where concentrations of different types of agricultural buildings occur drove the creation of the map. This information could then be used to help identify specific areas upon which to focus for closer study. The majority of structure types in the crop-covered area of Guadalupe appear to be farm units. However, there are also clusters of cemeteries, dwellings, and business establishments. One of these clusters located along the route of SH 123 is particularly large. This area is known to be rich in Anglo, Hispanic, and German ethnic settlements. The overlay confirms the likelihood that a wide variety of landscape characteristics suggesting historic agricultural practices will be present.

GIS as an Aid for Documenting Project Areas and Individual Properties

At a micro level, GIS also can be used to document dramatic changes over time, as evidenced by *Figures 8-25, 8-26, 8-27, and 8-28*. These graphics examine the Liberty Hill area of Williamson County and feature a 1962 USGS Quadrangle map along with a current parcel data map and aerial photograph. Whereas the 1962 map shows a largely rural landscape, the shape file map of 2009 from the county appraisal tax district office suggests that the area is in transition. For example, the partitioning of land into small residential-sized lots presents a departure from a long-standing tradition of large tracts of land used for agricultural purposes. Changes to the road network (US 183 and 183A Toll to the south) contributed to and/or reflected a population influx as well as encroaching suburbanization of the area. Current aerial photographs also document changes that have occurred in the 40-year span of time since the quadrangle map was published. For example, the post-1962 road near the top (north) of *Figures 8-26, 8-27, and 8-28* shows several residences that did not exist when the USGS map was published. The combined overall map (*Figure 8-28*) suggests that changes are underway that will affect the historic rural character of this landscape.

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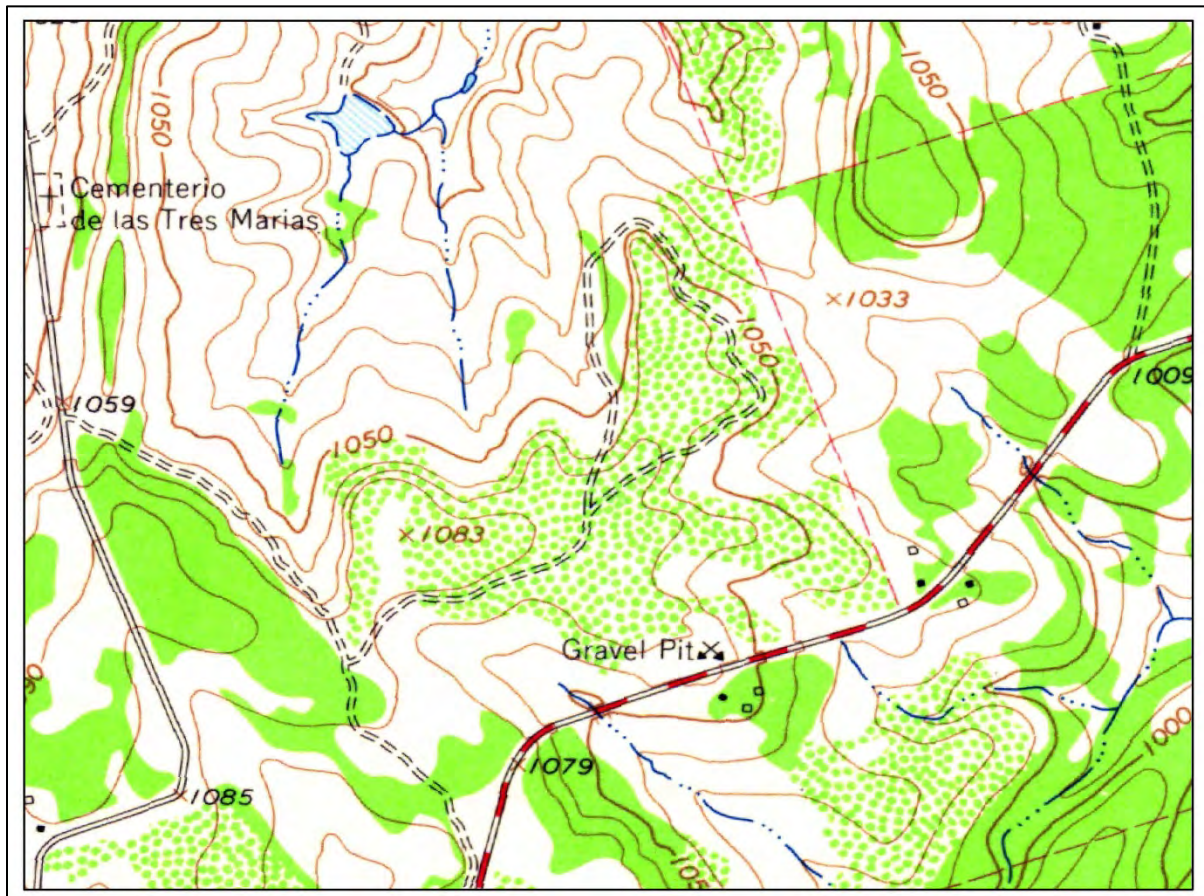


Figure 8-25. Detail of 1962 Leander Quadrangle Map from USGS. This is the first of a series of maps that is presented to show how map overlays can be used to document changes over time based on multiple sets of maps and aerial photographs. This area was chosen because of the rapid changes currently underway in this part of Williamson County, northwest of Austin.



Figure 8-26. Parcel Data from Williamson County Appraisal District.

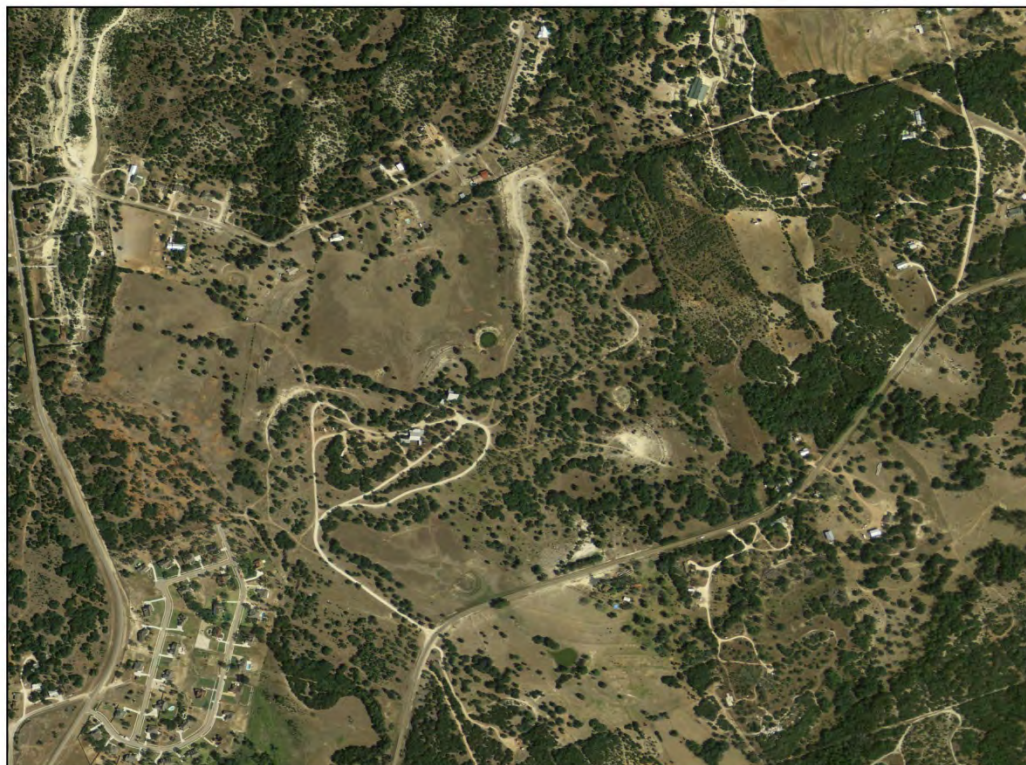


Figure 8-27. Aerial Photograph from TNRIS.

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Figure 8-28. Historic USGS Quadrangle Map, Current Aerial, and Current Parcel Data. GIS enables all of the three previous figures to be combined into a single image. Opacity settings in GIS allow the transparency level for each layer to be modified as desired. The image shows how this area near Austin is experiencing rapid growth and change. Improvements in the road network and other factors have both supported and responded to a large influx of new residents and increased suburbanization that have changed the historic rural character in western Williamson County. The subdivision of land into residential lots (noted in red), especially along US 183 (north-south roadway near the left border), represents a dramatic departure in land use from 1962 when the USGS map was published.

GIS also can be used to document individual properties, as illustrated in *Figures 8-29 and 8-30*. The steps used to create these figures are presented to show how different sets of cartographic data can be used. The process depicted in these figures is noteworthy because it demonstrates how an agricultural property can be identified and documented through the use of GIS. The information is confined to a limited amount of materials, but it shows how GIS is such a valuable tool for documenting and assessing cultural resources associated with agriculture in rural settings.

The information presented in this section demonstrates some of the capabilities that GIS can offer historians, researchers, and cultural geographers. More materials are becoming available in a digital format that will facilitate their integration into GIS. Historians should be creative in their approach to utilizing such a powerful tool as GIS and extrapolating and interpreting GIS data. The sometimes overwhelming amounts of data on GIS-based maps with multiple overlays can obscure or make less obvious important bits of information that can be gleaned from these visual aids. Users are encouraged to “think outside the box.” Guidelines illustrating how GIS can be used to record and evaluate

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agricultural properties for transportation undertakings are in Section 3, Fieldwork Guide and Methodology.

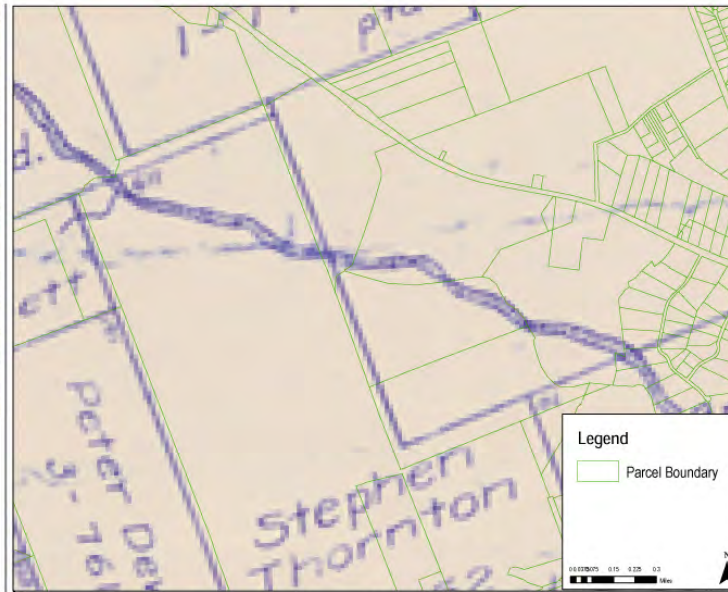
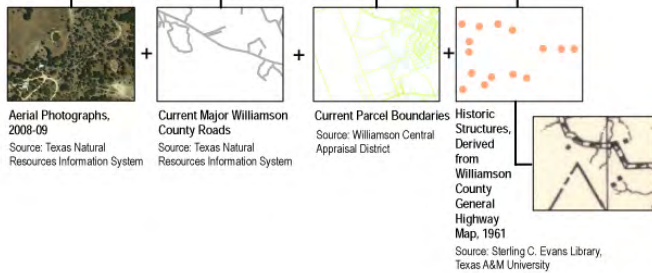
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Side-By-Side Comparison Of Overlays



Williamson County Overlay With Aerial Photographs

GIS Layers:



Williamson County Overlay With General Land Office Map

GIS Layers:

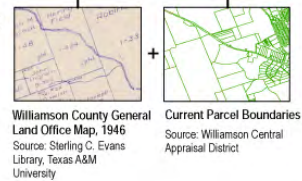
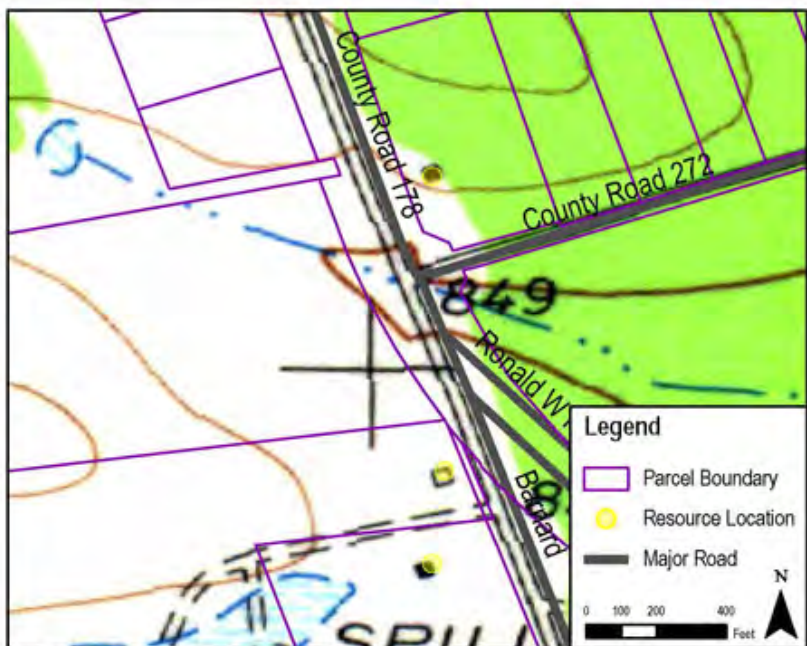


Figure 8-29. How Multiple Sets of Data Can Be Used to Document Individual Properties.

Mapping Analysis Example: Properties in Leander, Williamson County, Texas



PART 1. Using GIS, create map overlay with 1962 USGS Leander topographic map and current Williamson County parcels.

PART 2. Identify resource locations on topographic map.



PART 3. Create overlay showing same area with current aerial photographs, current Williamson County parcels, and resource locations identified in Part 1.



PART 4. Using Bing, view close-range aerial photographs and bird's eye maps of properties with resource locations identified in Parts 1-3.



Figure 8-30. Identifying and Documenting an Individual Property through GIS Map Analysis and Aerial Images from Online Sources (Bing Maps).