Chapter 2
Regional Summaries

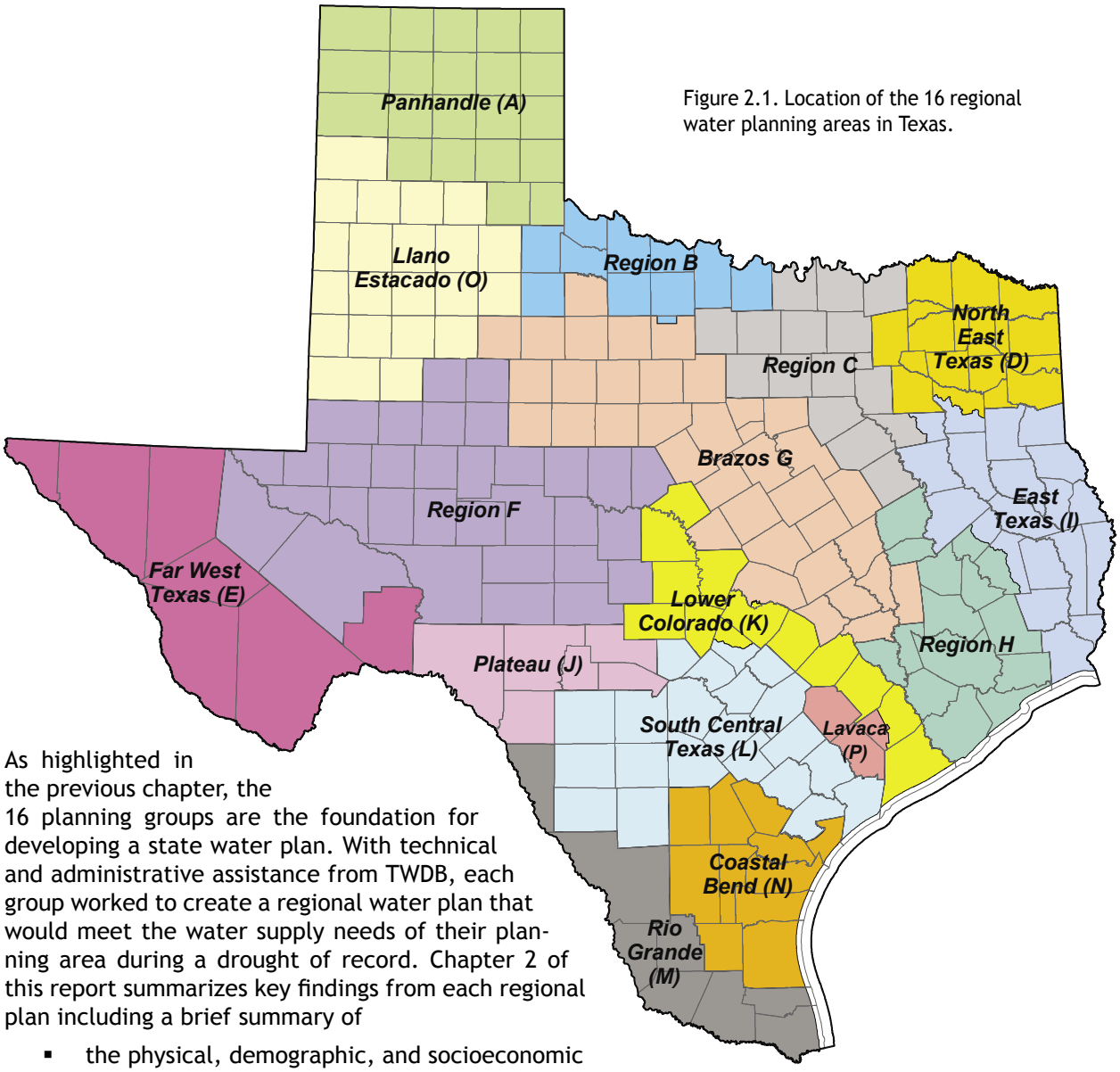


Figure 2.1. Location of the 16 regional water planning areas in Texas.

As highlighted in the previous chapter, the 16 planning groups are the foundation for developing a state water plan. With technical and administrative assistance from TWDB, each group worked to create a regional water plan that would meet the water supply needs of their planning area during a drought of record. Chapter 2 of this report summarizes key findings from each regional plan including a brief summary of

- the physical, demographic, and socioeconomic attributes of each region;
- population and water demand projections;
- existing water supplies, including groundwater, surface water, and reuse;
- future water supply needs;
- recommended water management strategies and their costs;
- the status of water conservation measures, including recommended water management strategies that rely on water conservation; and
- select, ongoing concerns, issues, and policy recommendations identified by each planning group.

Individual regional plans and a comprehensive database of regional water plan information are available in Volume III of this state water plan, which is online at TWDB's Web sites http://twdb.state.tx.us/data/db07/DefaultSelect.asp and http://www.twdb.state.tx.us/rwpg/planning_page.asp. In addition, Appendix 2.1 of this document contains a detailed tabular presentation of individual water management strategies for each region, including total capital and unit costs for each strategy and water supply volumes projected for each strategy by decade.

Summary of Panhandle (A) Region

Stretching from the rolling plains of Childress County in the southeast to Dallam County in the northern Panhandle, the Panhandle (Region A) Regional Water Planning Area includes 21 counties split between the Canadian and Red River basins (Figure A.1). The major cities in the region include Amarillo, Pampa, Borger, and Dumas. Groundwater from the Ogallala Aquifer is the region's primary source of water and is used at a rate that exceeds recharge. The economy of this region is grounded in agribusiness. The members of the Panhandle Planning Group are listed on the last page of this summary.

Population and Water Demands

Approximately 2 percent of the state's total population is projected to reside in the Panhandle Region in the year 2010. Between 2010 and 2060, its population is projected to increase 39 percent to 541,035 (Figure A.2). Its total water demands, however, are projected to decrease, driven by a decline in agricultural irrigation water use. By 2060, the total water demands for the region are projected to decrease 25 percent, from 1,864,748 acre-feet to 1,399,412 acre-feet (Figure A.3). Irrigation water use makes up the largest share of these demands in all decades and is projected to experience the only decrease (33 percent) over the planning period, from 1,652,230 acre-feet in 2010 to 1,106,034 acre-feet in 2060 (Table A.1). However, water demand for municipalities increases 29 percent over the planning period, from 68,137 acre-feet in 2010 to 87,658 acre-feet in 2060, while livestock demands grow 46 percent, from 61,236 acre-feet to 89,267 acre-feet. Water demand in all other categories also increases over the planning horizon.

Existing Water Supplies

The region primarily relies upon groundwater supply sources, with approximately 91 percent of the existing water supply in the Panhandle Region coming from the Ogallala Aquifer (Table A.2). Other aquifers (Blaine, Dockum, Seymour, and Rita Blanca) provide approximately 5 percent of the total supply, and surface water, including Lake Meredith and Greenbelt Lake, contributes another 3 percent of supplies. Reuse contributes the remaining 1 percent of existing water supply in the planning area. Of the supplies available from the Ogallala Aquifer, 90 percent is used for irrigation purposes. Due to the slow recharge rate of this aquifer, the region adopted a management policy that limits annual withdrawal to not more than 1.25 percent of the current saturated thickness of the aquifer. Because of this management practice, water supplies for the region are projected to

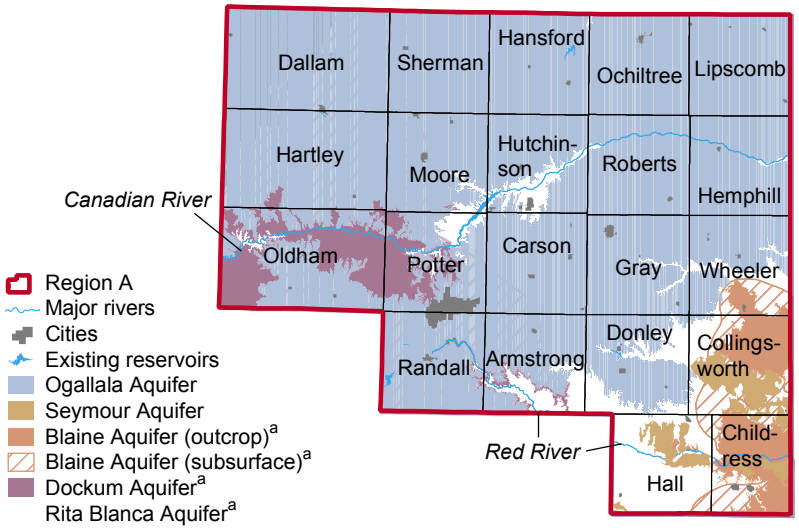


Figure A.1. Panhandle Region.

PLAN HIGHLIGHTS

- **Total capital cost $562 million**
- **Irrigation conservation is the primary recommended water management strategy**
- **Groundwater development is recommended for all municipalities and County-other water users with needs**
- **Unmet needs in irrigation**

decline 40 percent by 2060, from 1,893,932 acre-feet to 1,130,851 acre-feet.

Needs

Although supplies closely match demands in 2010, the total water supply volume is not accessible to all water users throughout the region (Figure A.4, Table A.3). In the event of drought, water needs occur across the region as early as 2010. Ninety-four percent (293,159 acre-feet) of the water supply needs identified in 2010 are associated with irrigated agriculture. By 2060, overall water needs are projected to increase 85 percent, from 310,554 acre-feet to 575,637 acre-feet, with 84 percent of this need in irrigated agriculture. Even with the recommended strategies fully implemented in the counties with needs, there will be approximately 308,959 acre-feet of unmet irrigation needs in 2060. Municipal needs also increase significantly, with Amarillo having the most at 25,572 acre-feet in 2060.

Recommended Water Management Strategies and Cost

The Panhandle Planning Group recommended water management strategies focused on conservation, groundwater development, and direct reuse. It also recommended connecting to the Palo Duro Reservoir. In all, the strategies would provide 412,146 acre-feet of additional water supply by the year 2060 (Figure A.5) at a **total capital cost of $562,404,683** (Appendix 2.1). However, the Canadian River Municipal Water Authority will provide some of this water to the Llano Estacado Region. Because there were no economically feasible strategies identified to meet their needs, **five counties in the region have unmet irrigation needs (308,959 acre-feet in 2060)**.

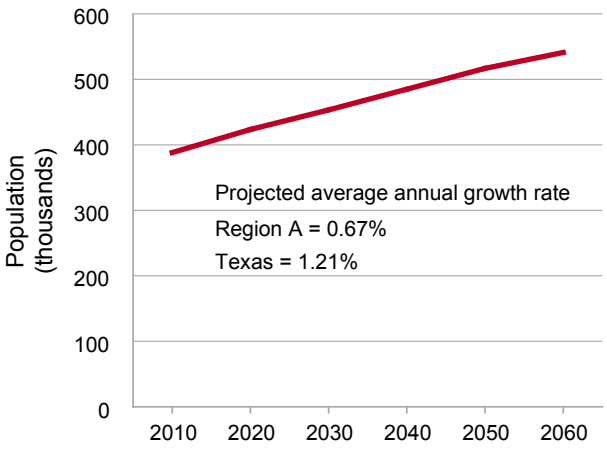


Figure A.2. Projected population for 2010-2060.

Conservation Recommendations

Conservation strategies represent 70 percent of the total volume of water associated with all recommended strategies. Water conservation was recommended for every municipal and manufacturing need and for all irrigation water user groups in the region. Municipal reductions are capped at 5 percent in 2060. Irrigation conservation is achieved through irrigation equipment improve-

Table A.1. Percent change in demand 2010-2060.

Category	2010 (acre-feet)	2060 (acre-feet)	Percent change in demand 2010-2060	Percent of overall demand in 2010	Percent change in relative share of overall demand, 2010-2060
Municipal	68,137	87,658	+29	+4	+3
County-other	9,468	16,584	+75	+1	+1
Manufacturing	43,930	58,231	+33	+2	+2
Mining	7,115	7,310	+3	0	0
Irrigation	1,652,230	1,106,034	-33	+89	-10
Steam-electric	22,632	34,328	+52	+1	+1
Livestock	61,236	89,267	+46	+3	+3
Region	1,864,748	1,399,412	-25		

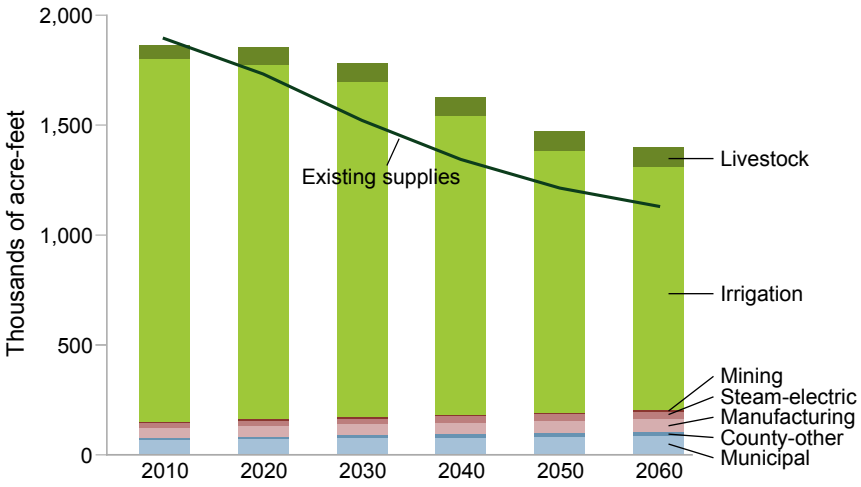
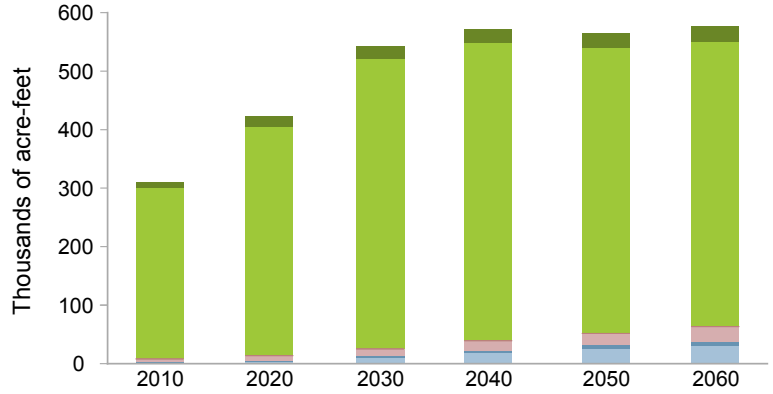


Figure A.3. Projected total water demand and existing water supplies for 2010–2060.



	2010	2020	2030	2040	2050	2060
Livestock	9,150	18,627	22,078	23,651	24,337	25,982
Irrigation	293,159	391,100	495,322	508,803	488,804	486,365
Steam-electric	75	99	117	128	136	154
Manufacturing	5,328	9,194	11,976	16,442	20,281	25,429
County-other	756	1,225	2,419	3,905	5,466	6,761
Municipal	2,086	3,084	10,893	18,739	25,976	30,946

Figure A.4. Projected water needs for 2010–2060.

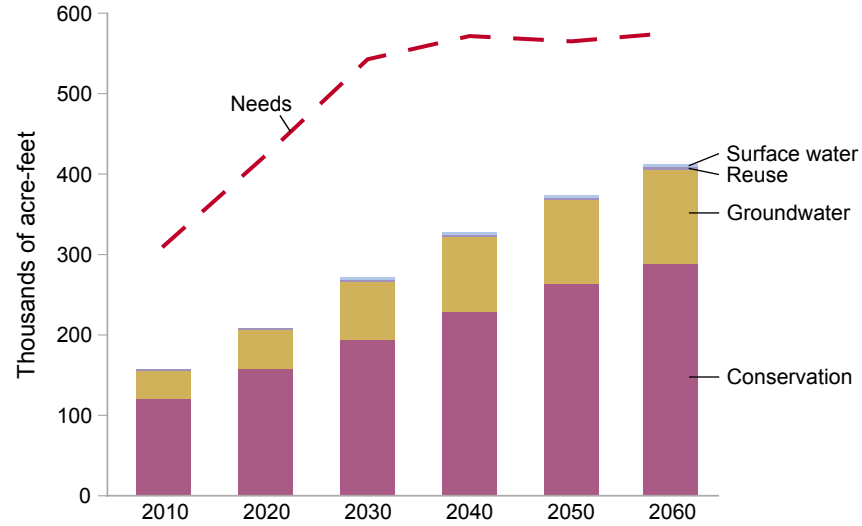


Figure A.5. Recommended water management strategy water supply volumes for 2010–2060.

Table A.2. Existing water supplies for 2010 and 2060

Water supply source	2010 (acre-feet)	2060 (acre-feet)
Surface water		
Lake Meredith	30,305	30,305
Livestock local supply	21,201	21,201
Other surface water	9,583	9,476
Surface water subtotal	**61,089**	**60,982**
Groundwater		
Ogallala Aquifer	1,715,250	948,141
Seymour Aquifer	41,271	38,271
Dockum Aquifer	24,420	19,220
Blaine Aquifer	19,740	19,740
Other groundwater	6,095	6,090
Groundwater subtotal	**1,806,776**	**1,031,462**
Reuse		
Direct reuse	26,067	38,407
Reuse subtotal	**26,067**	**38,407**
Region total	**1,893,932**	**1,130,851**

Note: Water supply sources are listed individually if 10,000 acre-feet per year or greater in 2010.
Only includes supplies that are physically and legally available to users during a drought of record.

ments, conservation tillage practices, use of the North Plains Evapotranspiration Network, and precipitation enhancement.

Ongoing Issues

The Panhandle Planning Group expressed concerns that groundwater availability for the region depends on achieving the goal of no greater than 1.25 percent annual depletion. There is a need to improve water supply information in rapidly growing rural areas to assist in securing future supplies. It is also important to further evaluate the long-range needs of Canadian River Municipal Water Authority member cities in the Panhandle and Llano Estacado regions. In addition, there is a need to study carefully the effects of energy costs on irrigation and agricultural water demands.

Select Policy Recommendations

- Manage groundwater resources through local groundwater conservation districts
- Encourage legislative funding of strategies in the plan
- Request that TWDB clarify guidelines for funding eligibility of rural areas
- Require coordination between planning groups and state agencies

Table A.3. Water needs (acre-feet per year) by county and type of use in years 2010 and 2060

County	Total		Municipal		County-other		Manufacturing		Steam-electric		Mining		Irrigation		Livestock	
	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060
Armstrong	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Carson	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Childress	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Collingsworth	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Dallam	130,403	131,493	602	891	108	140	–	–	–	–	–	–	124,918	119,181	4,775	11,281
Donley	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Gray	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hall	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hansford	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hartley	16,646	141,822	117	128	89	98	–	–	–	–	–	–	16,286	141,176	154	420
Hemphill	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hutchinson	9,274	46,362	–	–	–	–	2,300	15,931	–	–	–	–	6,974	30,431	–	–
Lipscomb	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Moore	66,455	93,931	1,180	3,232	495	1,605	3,028	7,627	75	154	–	–	60,475	77,491	1,202	3,822
Ochiltree	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Oldham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Potter	–	18,220	–	14,210	–	2,139	–	1,871	–	–	–	–	–	–	–	–
Randall	–	14,634	–	12,015	–	2,619	–	–	–	–	–	–	–	–	–	–
Roberts	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Sherman	87,776	129,175	187	470	64	160	–	–	–	–	–	–	84,506	118,086	3,019	10,459
Wheeler	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Region	310,554	575,637	2,086	30,946	756	6,761	5,328	25,429	75	154	–	–	293,159	486,365	9,150	25,982

SELECT MAJOR WATER MANAGEMENT STRATEGIES

(Dollar amounts are rounded. See Appendix 2.1 for all recommended strategies and actual costs.)

- *Irrigation conservation strategy by regional agricultural producers would provide a total of 282,549 acre-feet per year*—Implementation by: 2010; Capital Cost: $145 million.
- *Expansion of Canadian River Municipal Water Authority groundwater supply would supply its member cities with 30,148 acre-feet per year*—Implementation by: 2010; Capital Cost: $79 million.
- *Groundwater development for livestock, manufacturing, steam-electric, municipal, and County-other uses would produce 87,072 acre-feet per year*—Implementation by: 2010; Capital Cost: $264 million.
- *Direct reuse for manufacturing needs in Hutchinson and Moore Counties would produce 2,700 acre-feet per year*—Implementation by: 2010; Capital Cost: $2 million.

Panhandle Planning Group Members and Interests Represented

Voting members during adoption of 2006 Regional Water Plan:

C.E. Williams (Chair), water districts; Richard Bowers, water districts; Inge Brady, environmental; Nolan Clark, environmental; Dan Coffey, municipalities; Vernon Cook, counties; Charles Cooke, water utilities; Jim Derington, river authorities; B.A. Donelson, agriculture; Rusty Gilmore, small business; Janet Guthrie, public; Bill Hallerberg, industries; Gale Henslee, electric generating utilities; Denise Jett, industries; Bobbie Kidd, water districts; David Landis, municipalities; Grady Skaggs, environmental; John M. Sweeten, higher education; Rudie Tate, agriculture; Janet Tregellas, agriculture; Ben Weinheimer, agriculture; John C. Williams, water districts

Former voting members during 2001-2006 planning cycle:

Dean Looper, public; Frank Simms, agriculture