1.2 Current Water Uses and Demand Centers in Region F

Table 1-5 shows water use from 2006-2016 by TWDB use category and Figure 1-11 illustrates a graph of the data.[8] Table 1-6 shows the total water use by county in Region F for the same period. Water use in Region F increased between 2006 and 2016 and has generally increased in recent years. Since 2008, mining activity and its associated water use has markedly increased.

Table 1-5
Historical Water Use by Category in Region F (Values in acre-feet)

Year	Municipal	Manufacturing	Irrigation	SEP	Mining	Livestock	Total
2006	158,671	10,839	418,636	3,731	4,922	15,206	612,005
2007	114,630	12,704	408,888	3,670	4,253	14,690	558,835
2008	119,335	11,718	381,254	6,081	21,136	14,409	553,933
2009	148,843	13,383	446,157	6,010	20,399	14,343	649,135
2010	142,873	10,363	458,658	6,068	22,354	13,905	654,221
2011	162,266	6,898	494,192	3,567	33,362	14,006	714,291
2012	117,781	5,955	447,476	3,747	29,394	11,597	615,951
2013	123,902	5,913	466,502	3,601	27,234	10,094	637,246
2014	130,839	5,524	470,242	3,573	38,730	10,187	659,095
2015	119,988	5,892	438,822	3,202	62,454	10,001	640,359
2016	115,624	5,716	459,192	9,249	74,438	10,170	674,389
State Total in 2016	*4,412,828*	*1,068,124*	*7,831,789*	*464,763*	*168,312*	*325,385*	*14,271,201*
% of State Total in Reg F	*2.62%*	*0.54%*	*5.86%*	*1.99%*	*44.23%*	*3.13%*	*4.73%*

Note: Data are from the Texas Water Development Board.[8]

Figure 1-11
Historical Water Use by Category in Region F

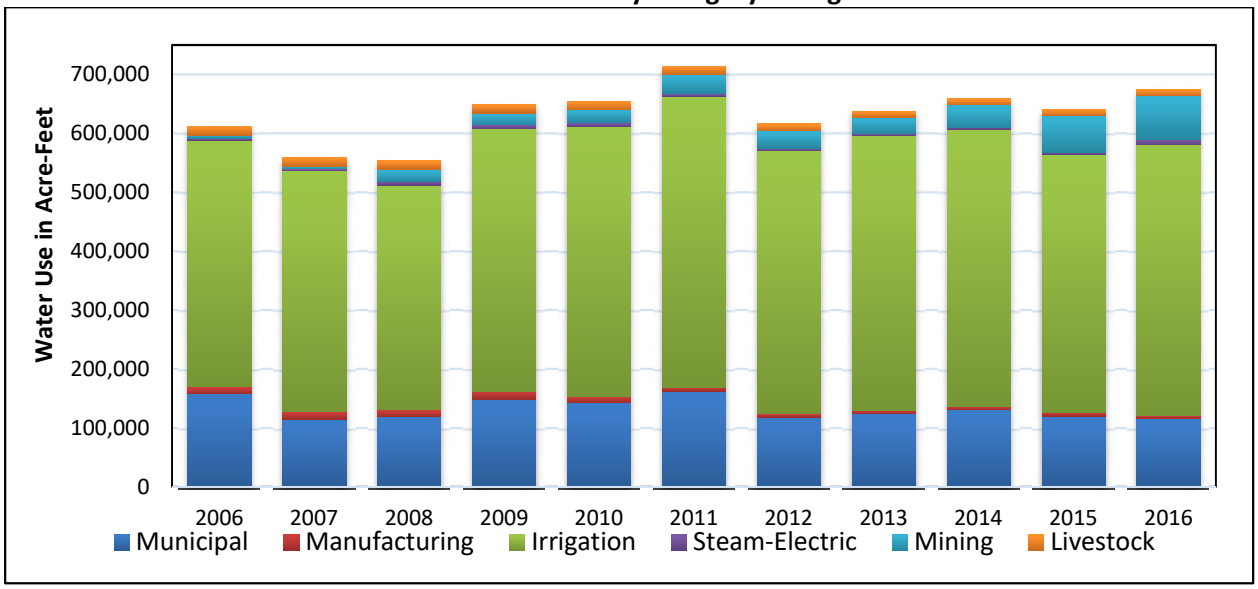


Table 1-6
Historical Total Water Use by County in Region F (Values in acre-feet)

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Andrews	34,637	42,249	35,479	29,221	28,083	29,204	29,788	23,873	20,293	20,836	22,162
Borden	2,788	2,951	2,888	4,592	2,180	4,326	3,848	4,450	2,300	2,238	2,682
Brown	18,145	12,380	18,534	16,447	17,592	18,451	14,708	13,699	12,842	13,708	12,803
Coke	1,825	1,392	1,621	1,638	2,028	2,246	1,430	1,269	1,070	963	1,259
Coleman	3,461	2,891	3,161	3,244	2,769	2,962	2,458	2,223	2,305	2,330	2,705
Concho	9,009	6,496	10,807	3,667	8,224	3,911	5,706	6,010	5,593	5,464	5,484
Crane	1,869	1,665	2,515	1,768	1,617	1,987	1,939	1,859	1,709	2,118	1,315
Crockett	2,518	2,386	2,646	2,274	2,315	3,182	3,857	4,579	4,632	3,595	3,129
Ector	29,334	25,246	25,788	26,985	28,743	30,510	23,750	25,968	24,263	22,005	25,458
Glasscock	46,925	38,203	43,775	46,868	58,316	55,648	48,750	52,337	54,900	30,093	41,496
Howard	10,285	16,717	14,120	15,329	15,935	18,641	13,146	13,299	14,778	15,741	16,752
Irion	1,120	812	1,308	2,226	2,268	3,238	3,777	4,235	4,300	3,353	2,871
Kimble	4,355	2,744	4054	4693	4812	4670	4367	4204	3912	3,900	3,708
Loving	108	67	147	209	258	477	839	326	543	4,411	6,006
Martin	16,187	26,412	29,740	38,263	37,706	38,303	35,181	44,968	41,722	42,873	35,629
Mason	8,903	4,884	7,811	9,032	5,864	8,065	7,174	6,483	6,880	6,422	6,399
McCulloch	8,685	6,858	10,893	12,095	13,203	13,205	7,518	6,866	8,086	8,457	8,062
Menard	3,228	2,771	1,675	2,471	3,048	6,067	2,622	5,827	5,104	4,766	4,312
Midland	53,624	44,433	53,691	55,170	42,420	57,661	45,287	29,345	36,468	55,081	72,169
Mitchell	9,152	11,622	13,113	16,841	14,832	15,626	21,212	18,671	20,400	17,916	16,832
Pecos	74,827	63,436	63,644	98,399	132,030	187,827	115,433	145,945	165,572	163,235	161,528
Reagan	20,274	17,882	21,047	18,415	21,002	28,707	23,223	24,316	31,317	28,194	26,384
Reeves	94,549	84,066	31,535	63,449	63,896	57,984	59,368	81,055	60,411	61,286	78,841
Runnels	5,922	4,449	6,163	5,607	5,657	4,416	5,573	5,262	5,219	6,235	5,421
Schleicher	2,037	1,536	2,248	2,600	2,587	3,371	3,160	2,833	3,099	2,613	3,004
Scurry	9,005	8,087	8,121	10,586	9,365	10,078	12,691	10,287	10,623	8,932	9,411
Sterling	1,169	1,005	1,349	1,672	1,337	1,630	1,501	1,785	1,675	1,414	1,199
Sutton	3,295	3,265	2,208	2,210	2,728	3,343	2,669	2,460	2,671	2,324	2,356
Tom Green	70,393	92,453	106,446	92,724	67,915	36,919	76,657	56,306	64,204	74,598	64,504
Upton	8,370	7,156	11,965	10,569	12,014	17,486	13,876	12,459	14,722	13,655	15,249
Ward	12,650	9,895	7,643	11,324	10,747	9,935	5,069	4,785	7,011	7,807	9,794
Winkler	11,372	9,787	4,691	5,522	4,900	6,707	6,405	5,180	5,927	3,796	5,465
Total	***580,021***	***556,196***	***550,826***	***616,110***	***626,391***	***686,783***	***602,982***	***623,164***	***644,551***	***640,359***	***674,389***

Note: Data are from the Texas Water Development Board.[8]
Data for Reeves County after 2003 includes all water released from the Red Bluff Reservoir. Approximately 25% of this water is delivered to customers in Pecos, Reeves, Ward and Loving Counties. The remaining 75% of the water is lost to evaporation and stream losses.

Table 1-7 shows water use by category and county in 2016, and Figure 1-12 shows the distribution of water use by county in the region. The data in Table 1-7 lead to the following observations about year 2016 water use in Region F:

- The areas with the highest water use are Midland, Pecos, Reeves, and Tom Green Counties, accounting for over half of the total water used in the region.
- Most of the municipal water use occurred in Ector, Midland, and Tom Green Counties, location of the cities of Odessa, Midland, and San Angelo, respectively. In the year 2016, these counties accounted for approximately 60 percent of the water use in this category. Other significant municipal demand centers include Brown County (Brownwood), Pecos County (Fort Stockton), Reeves County (Pecos), and Howard County (Big Spring).
- Manufacturing water use is small in Region F. Use in this category is concentrated in Kimble and Tom Green counties.
- Reeves, Pecos, and Tom Green Counties accounted for most of the reported irrigation water use in 2016, accounting for more than a half of the irrigation water use in the region. However, some of the water reported for irrigation in Reeves County is associated with delivery losses from the Red Bluff Reservoir. The actual use of irrigation water in Reeves County is somewhat less than shown. Other significant demand centers for irrigation water include Glasscock, Martin, and Reagan Counties.
- Steam-electric power generation water use occurred only in Ector, Howard, Mitchell, Scurry, and Ward Counties during the year 2016. Facilities in other counties have temporarily or permanently ceased operations.
- Most of the water used for mining purposes occurred in Martin, Midland, Reeves, and Upton Counties, accounting for approximately 58 percent of the total use. Mining activities across the region have increased significantly since 2007. Region F accounted for nearly 45% of the mining water use in the entire state in 2016.
- Livestock is a small water use category in Region F. Most of the livestock water use occurred in Brown, Coleman, Mason, Pecos, and Tom Green Counties.

In addition to the consumptive water uses discussed previously, water-oriented recreation is important in Region F. Table 1-8 summarizes recreational opportunities at major reservoirs in the region[7]. Smaller lakes and streams provide opportunities for fishing, boating, swimming, and other water-related recreational activities. Water in streams and lakes is also important to fish and wildlife in the region, providing a wide variety of habitats. However, during the recent drought many of these recreational activities have been impacted by low streamflow, runoff, and lake levels.

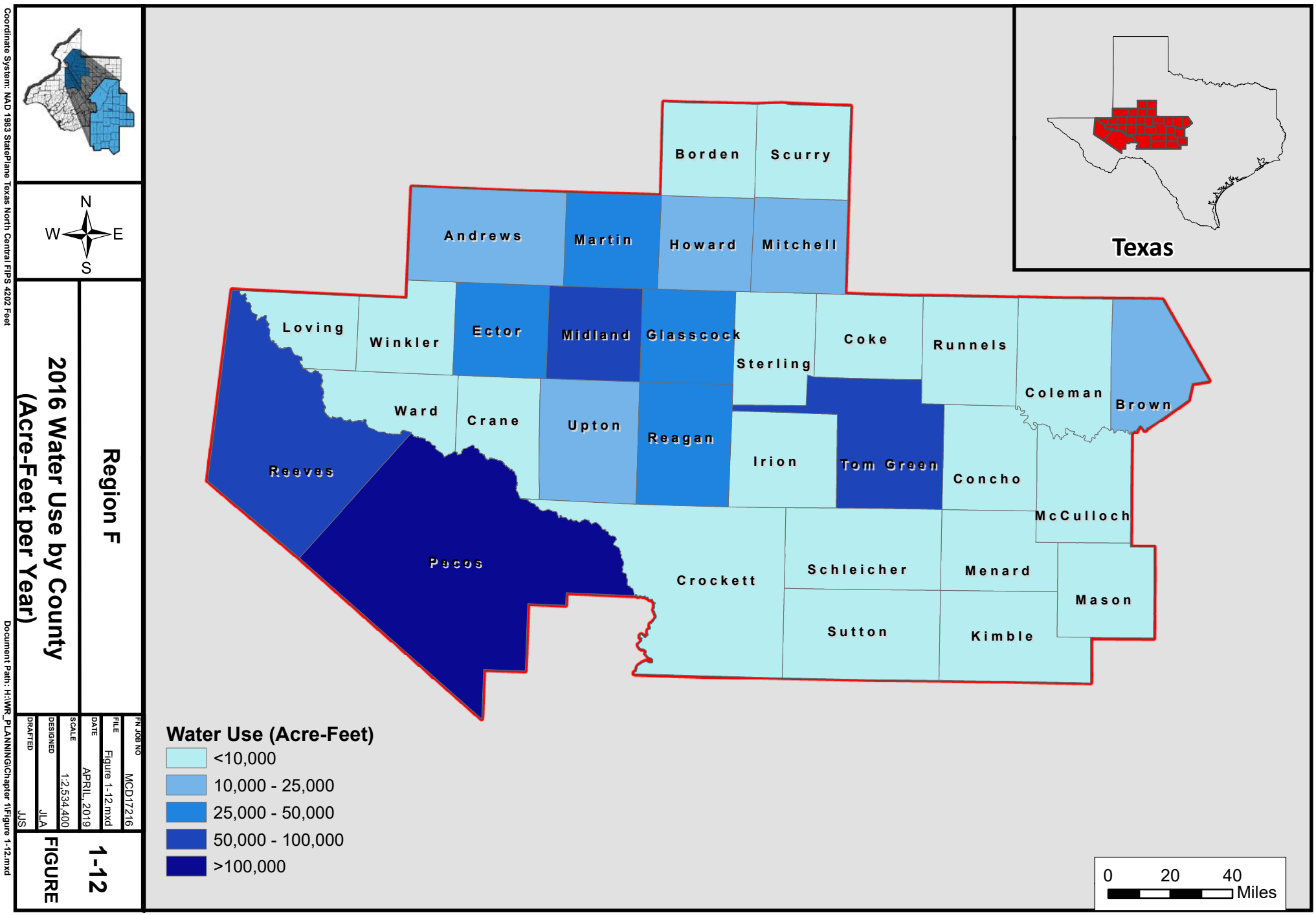
Table 1-7
Year 2016 Water Use by Category and County (Values in acre-feet)

County	Municipal	Manu-facturing	Irrigation	Steam-Electric	Mining	Livestock	Total
ANDREWS	3,396	42	16,536	0	1,997	191	22,162
BORDEN	161	0	2,214	0	178	129	2,682
BROWN	4,785	387	6,622	0	0	1,009	12,803
COKE	488	31	511	0	8	221	1,259
COLEMAN	1,789	1	273	0	0	642	2,705
CONCHO	530	0	4,622	0	0	332	5,484
CRANE	919	288	0	0	43	65	1,315
CROCKETT	1,080	33	17	0	1550	449	3,129
ECTOR	18,960	355	804	4853	387	99	25,458
GLASSCOCK	122	35	37,376	0	3,852	111	41,496
HOWARD	5,076	2,569	3,662	331	4,894	220	16,752
IRION	148	5	910	0	1,606	202	2,871
KIMBLE	562	546	2,376	0	0	224	3,708
LOVING	23	0	0	0	5948	35	6,006
MARTIN	669	0	28,245	0	6,629	86	35,629
MASON	639	0	4,894	0	187	679	6,399
MCCULLOCH	1,289	72	1,168	0	5,048	485	8,062
MENARD	274	0	3,738	0	0	300	4,312
MIDLAND	34,391	227	19,322	0	17,958	271	72,169
MITCHELL	1,352	2	11,943	3,180	0	355	16,832
PECOS	6,427	221	153,014	0	1,235	631	161,528
REAGAN	623	0	20,244	0	5,368	149	26,384
REEVES[b]	5,145	6	65,423	0	7,791	476	78,841
RUNNELS	1,268	4	3,559	0	6	584	5,421
SCHLEICHER	467	0	2,209	0	10	318	3,004
SCURRY	1,982	117	5,995	845	64	408	9,411
STERLING	235	0	720	0	7	237	1,199
SUTTON	870	1	1,140	0	0	345	2,356
TOM GREEN	15,773	701	47,400	0	1	629	64,504
UPTON	821	41	6,685	0	7,566	136	15,249
WARD	3,570	0	4,830	40	1,292	62	9,794
WINKLER	1,790	32	2,740	0	813	90	5,465
REGIONAL TOTAL	115,624	5,716	459,192	9,249	74,438	10,170	674,389
STATE TOTAL	4,412,828	1,068,124	7,831,789	464,763	168,312	325,385	14,271,201

Note: Data are from the Texas Water Development Board.[8]

a. Great Plains sells water to a Steam Electric Facility in Ector County

b. Data for Reeves County includes all water released from the Red Bluff Reservoir.



2016 Water Use by County (Acre-Feet per Year)

Region F

FIGURE 1-12

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Coordinate System: NAD 1983 StatePlane Texas North Central FIPS 4202 Feet

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Table 1-8
Recreational Use of Reservoirs in Region F

Reservoir Name	County	Fishing	Boat Launch	Swimming Area	Marina	Picnic Area	Camping	Hiking Trails	Bicycle Trails	Equestrian Trails	Pavilion Area
Lake J. B. Thomas	Borden and Scurry	X	X			X	X				X
Lake Colorado City	Mitchell	X	X	X		X	X	X	X		X
Champion Creek Reservoir	Mitchell	X	X			X	X				
Oak Creek Reservoir	Coke	X	X	X	X	X	X				
Lake Coleman	Coleman	X	X	X	X	X	X				
E. V. Spence Reservoir	Coke	X	X	X	X	X	X				X
Lake Winters/ New Lake Winters	Runnels	X	X	X		X	X	X			X
Lake Brownwood	Brown	X	X	X		X	X	X	X		X
Hords Creek Lake	Coleman	X	X	X		X	X	X	X		X
Lake Ballinger / Lake Moonen	Runnels	X	X	X		X	X				
O. H. Ivie Reservoir	Concho and Coleman	X	X		X	X	X				X
O. C. Fisher Lake	Tom Green	X	X	X		X	X	X	X	X	X
Twin Buttes Reservoir	Tom Green	X	X	X		X	X	X			
Lake Nasworthy	Tom Green	X	X	X	X	X	X	X	X		X
Brady Creek Reservoir	McCulloch	X	X	X	X	X	X	X		X	X
Mountain Creek Lake	Coke										
Red Bluff Reservoir	Reeves and Loving	X	X			X	X				
Lake Balmorhea	Reeves	X	X	X		X	X				

Note: "X" indicates that the activity is available at the specified reservoir.

1.3 Current Sources of Water

Table 1-9 summarizes the total surface water, groundwater, and reuse water use in Region F from 2006 through 2016, and Figure 1-13 graphically illustrates the same data. Total water use increased by approximately 62,000 acre-feet (10 percent) between 2006 and 2016. Groundwater use increased by more than 130,000 feet (34.1 percent) and surface water use decreased by over 95,000 acre-feet (48.2 percent) over the same period. Estimates of reuse water and brackish water (for mining) use were first recorded by the TWDB on a countywide basis in the year 2015. Between 2015 and 2016, there was an increase of over 7,000 acre-feet (11 percent) of reuse water use.

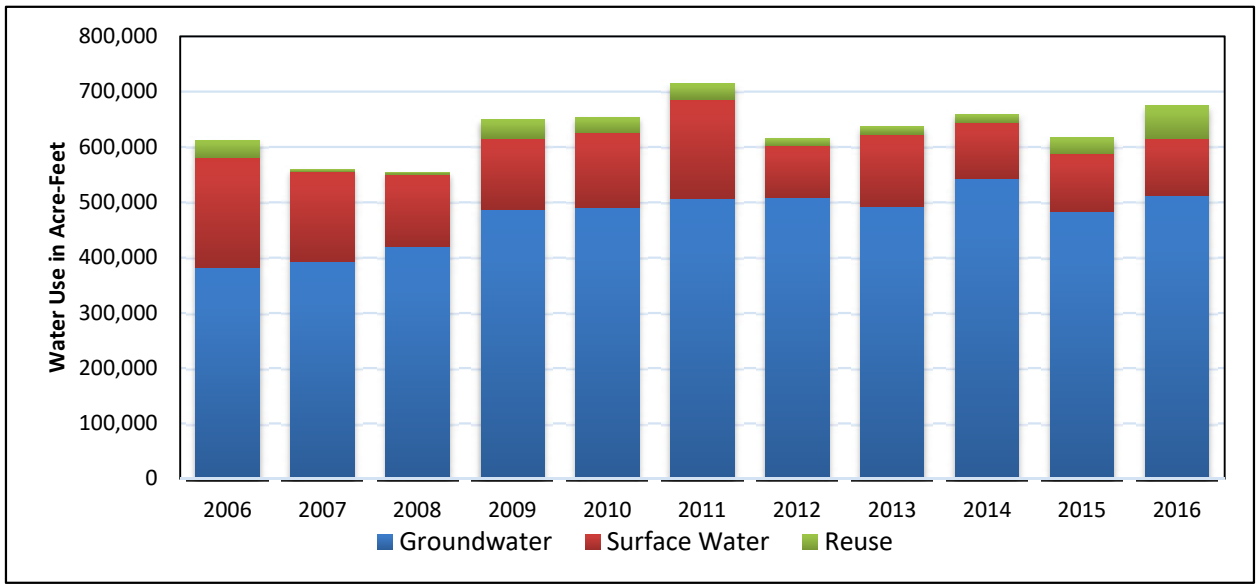
Figure 1-15 shows the percentage of supply from groundwater, broken down by county, in the region in the year 2016. Overall, groundwater use has shown an increasing trend ranging from 62 percent of total water use in 2006 to 76 percent in 2016. In contrast, surface water use has shown a decreasing trend ranging from 32 percent of total water use in 2006 to 15 percent in 2016.

Table 1-9
Historical Groundwater, Surface Water, and Reuse Water Use in Region F

Year	Water Use in Acre-Feet			
	Groundwater	Surface Water	Reuse[a]	Total
2006	382,461	197,560	31,984	580,021
2007	392,721	163,475	2,639[b]	556,196
2008	419,370	131,456	3,107[b]	550,826
2009	487,538	128,572	33,025	616,110
2010	490,590	135,801	27,830	626,391
2011	507,301	179,482	27,508	686,783
2012	507,814	95,166	12,969	602,980
2013	492,875	130,285	14,082	623,160
2014	542,963	101,589	14,544	644,552
2015	482,762	104,603	52,994	640,359
2016	512,919	102,416	59,054	674,389

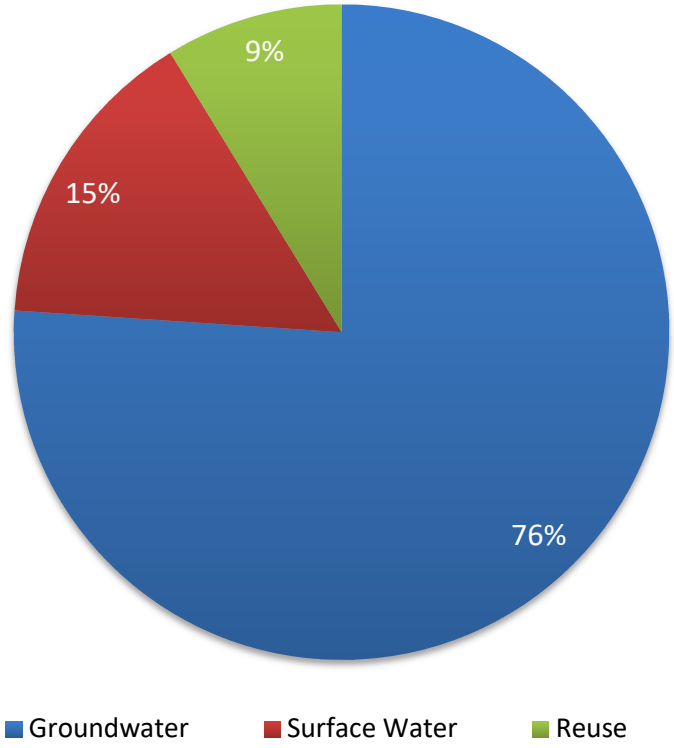
Note: Data are from Texas Water Development Board.[8]
a. Values from 2000-2014 only reflect entities that reported water reuse during that year.
Annual reuse and brackish water (for mining) use was not reported through all of Region F until 2015.
b. Odessa reported substantially less water reuse in 2007 and 2008.

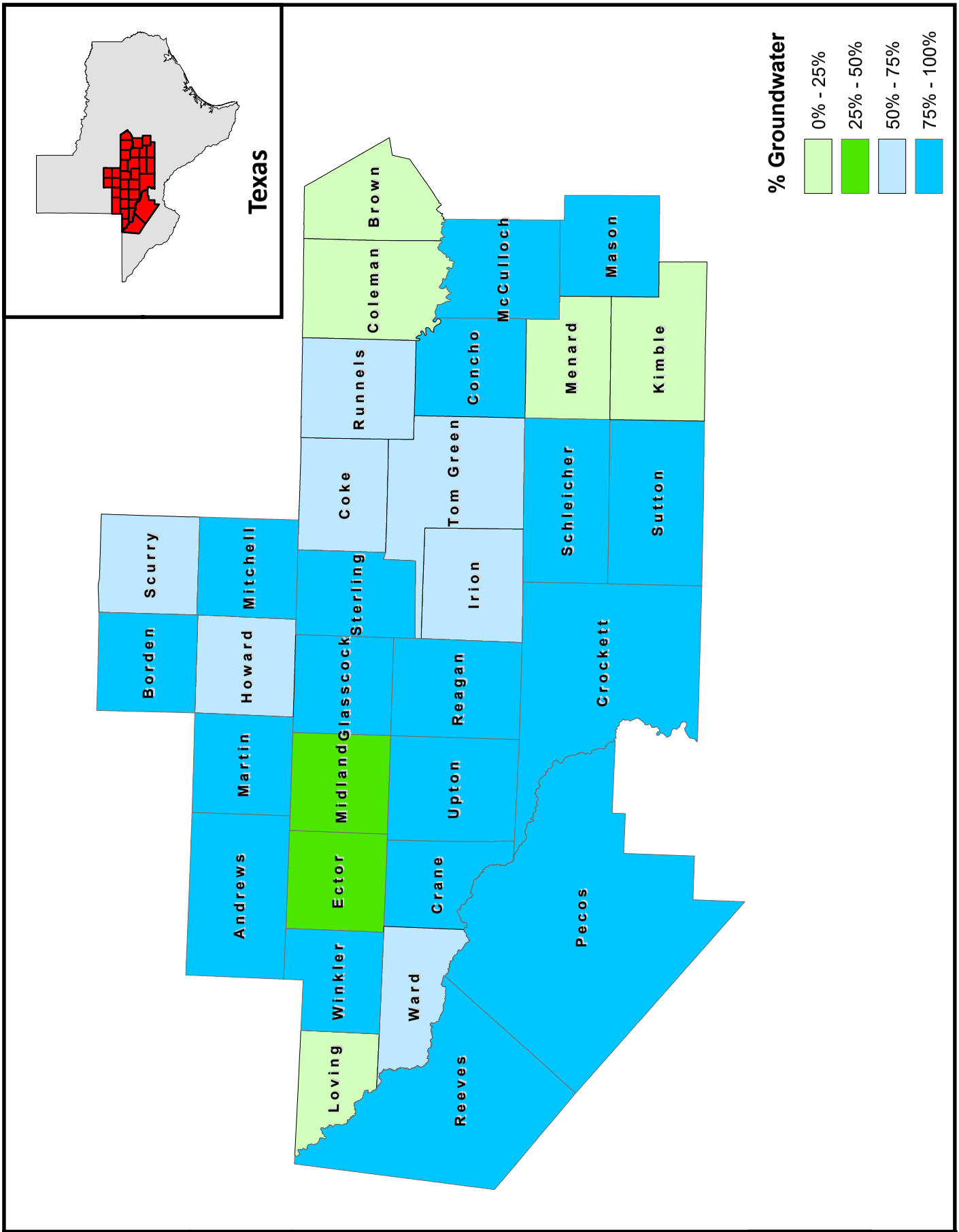
Figure 1-13
Historical Groundwater, Surface Water, and Reuse Water Use in Region F*



*Values from 2000-2014 only reflect entities that reported water reuse during that year. Annual water reuse was not reported through all of Region F until 2015.

Figure 1-14
Groundwater, Surface Water, and Reuse Water Use in Region F in 2016





N E S W

Region F

Supplies from Groundwater by County (2016)

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1-15 FIGURE

Coordinate System: NAD 1983 StatePlane Texas North Central FIPS 4202 Feet

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1.3.1 Surface Water Sources

Table 1-10 summarizes permitted surface water diversions by use category for each county in Region F. (These categories differ slightly from the demand categories used by TWDB for regional water planning.) Table 1-10 does not include non-consumptive use categories such as recreation. Figure 1-16 shows the distribution of permitted diversions by county and use type. Most of the large surface water diversions in Region F are associated with major reservoirs. Table 1-4 in Section 1.1.2 lists the permitted diversions and the reported year 2016 water use from major water supply reservoirs in the region.

Region F does not import a significant amount of surface water from other regions. Region F exports water to two cities in Region G: Sweetwater and Abilene. The City of Sweetwater owns and operates Oak Creek Reservoir, a 30,000 acre-feet reservoir in Coke County. The City of Abilene has a contract with the Colorado River Municipal Water District (CRMWD) for 16.54% of the safe yield of O.H. Ivie Reservoir. Facilities to transfer water from Lake O.H. Ivie to Abilene became operational in September 2003. Small amounts of surface water are supplied to the Cities of Lawn and Rotan, which are both in Region G. Several rural water supply corporations also supply small amounts of surface water to neighboring regions.

Table 1-10
Surface Water Rights by County and Category

County	Permitted Surface Water Diversions (Acre-Feet per Year)					
	Municipal	Industrial	Irrigation	Mining	Other	Total
Borden	200	0	63	0	0	263
Brown	29,712	0	8,729	0	0	38,441
Coke	44,865	6,000	969	16,361[a]	0	68,195
Coleman[b]	110,890	14,509	6,522	0	20	131,941
Concho	35	0	2,356	0	16	2,407
Ector	0	0	3,200	0	0	3,200
Howard	1,700	0	89	8,215	0	10,004
Irion	0	0	5,426	0	0	5,426
Kimble	1,000	2,472	8,450	60	0	11,982
Martin	0	2,500	0	0	0	2,500
Mason	0	0	356	0	0	356
McCulloch	3,500	0	2,152	0	0	5,652
Menard	1,016	0	10,586	3	2	11,607
Mitchell	8,200	4,050	123	0	0	12,373
Pecos	0	0	66,902	0	0	66,902
Reeves[c]	0	0	347,366	0	0	347,366
Runnels	2,919	0	7,024	70	0	10,013
Schleicher	0	0	38	3	0	41
Scurry[d]	30,000	0	503	0	0	30,503
Sterling	0	0	168	0	0	168
Sutton	0	0	99	3	0	102
Tom Green	108,069	8,002	40,985	0	16	157,072
Total	***342,106***	***37,533***	***512,105***	***24,715***	***54***	***916,513***

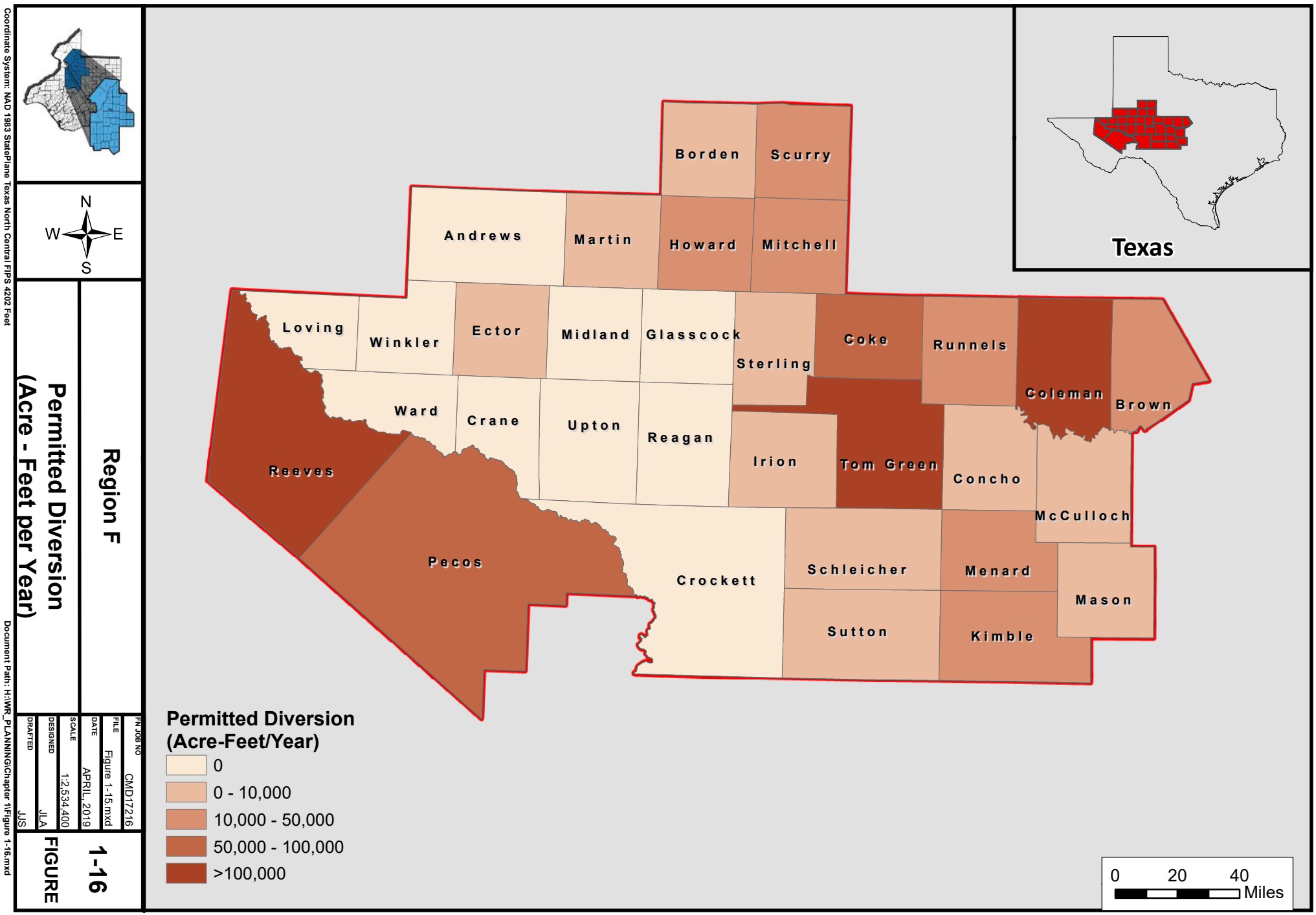
a. Includes up to 6,000 acre-feet per year that can be diverted and used in Mitchell or Howard Counties

b. Includes water rights for Ivie Reservoir, which is located in Coleman, Concho and Runnels Counties.

c. Includes rights for Red Bluff Reservoir, which is located in Loving and Reeves Counties.

d. Includes rights for Lake J.B. Thomas, which is located in Borden and Scurry Counties.

Note: Data are from TCEQ's active water rights list.[5] Other counties have no permitted water rights on the TCEQ list. Does not include recreation rights.



Region F

Permitted Diversion
(Acre - Feet per Year)

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FIGURE 1-16

Coordinate System: NAD 1983 StatePlane Texas North Central FIPS 4202 Feet

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1.3.2 Groundwater Sources

As previously discussed in section 1.1.2, there are 14 aquifers that supply water to the 32 counties of Region F: four major aquifers (Edwards-Trinity Plateau, Ogallala, Pecos Valley, and Trinity) and ten minor aquifers (Capitan Reef Complex, Cross Timbers, Dockum, Edwards-Trinity High Plains, Ellenberger-San Saba, Hickory, Igneous, Lipan, Marble Falls, and Rustler). The TWDB defines a major aquifer as an aquifer that supplies large quantities of water to large areas.[9] Minor aquifers supply large quantities of water to small areas, or relatively small quantities of water to large areas. The Trinity aquifer is considered a major aquifer by the TWDB because it supplies large quantities of water in other regions. However, the Trinity aquifer covers only a small portion of Region F in Brown County and supplies a relatively small amount of water in the region.

Table 1-11 shows the 2016 groundwater use by county and aquifer.[8] The Edwards-Trinity Plateau, Pecos Valley, and Ogallala are the largest sources of groundwater in Region F, providing 35.7 percent, 20.2 percent, and 13.0 percent of the total groundwater pumped in 2016, respectively. The Lipan aquifer provided approximately 5.4 percent of the 2016 totals, with all remaining aquifers contributing 25.7 percent combined. Groundwater pumping is highest in Glasscock, Martin, Pecos, Reeves, Reagan, and Tom Green Counties. Approximately 70 percent of the regions total pumping occurs in these six counties.

Groundwater conservation districts are the preferred method for managing groundwater in the State of Texas. There are 16 Underground Water Conservation Districts (GCDs) in Region F (Figure 1-17). These entities are required to develop and adopt comprehensive management plans, permit wells that are drilled, completed or equipped to produce more than 25,000 gallons per day, keep records of well completions, and make information available to state agencies. Other powers granted to GCDs are prevention of waste, conservation, recharge projects, research, distribution and sale of water, and making rules regarding transportation of groundwater outside of the district.[10]

Fifteen of the GCDs in Region F form the West Texas Regional Groundwater Alliance, an organization that promotes the conservation, preservation and beneficial use of water and related resources in the region. Seven of the GCDs are also members of the West Texas Weather Modification Association, a group that performs rainfall enhancement activities in a seven-county area.

Table 1-11
Groundwater Pumping by County and Aquifer 2016 (Values in Acre-Feet)

County	Edwards -Trinity Plateau	Ogallala	Pecos Valley	Lipan	Hickory	Dockum	Trinity	Ellen-berger-San Saba	Marble Falls	Edwards -Trinity High Plains	Rustler	Capitan Reef Complex	Igneous	Other[a]	*Total*
Andrews	2	19,815	138	0	0	10	0	0	0	0	0	0	0	1,360	21,325
Borden	0	2,008	0	0	0	23	0	0	0	9	0	0	0	521	2,561
Brown	0	0	0	0	0	0	958	0	0	0	0	0	0	95	1,053
Coke	92	0	0	0	0	0	0	0	0	0	0	0	0	706	798
Coleman	0	0	0	0	0	0	0	0	0	0	0	0	0	65	65
Concho	149	0	0	2,642	425	0	0	0	0	0	0	0	0	1,792	5,008
Crane	0	0	1,055	0	0	175	0	0	0	0	0	0	0	29	1,259
Crockett	1,578	0	0	0	0	2	0	0	0	0	0	0	0	1,054	2,634
Ector	2,453	165	0	0	0	67	10	0	0	0	0	0	0	255	2,950
Glasscock	32,455	4,849	0	0	0	0	0	0	0	0	0	0	0	3,000	40,304
Howard	1,585	2,932	0	0	0	314	0	0	0	0	0	0	0	3,604	8,435
Irion	419	0	0	0	0	1	0	0	0	0	0	0	0	1,132	1,552
Kimble	272	0	0	0	25	0	2	4	0	0	0	0	0	255	558
Loving	0	0	36	0	0	19	0	0	0	0	1	0	0	1,192	1,248
Martin	0	30,190	0	0	0	0	0	0	0	0	0	0	0	4,505	34,695
Mason	10	0	0	0	5,798	0	1	73	0	0	0	0	0	244	6,126
McCulloch	77	0	0	0	8,941	0	0	198	17	0	0	0	0	119	9,352
Menard	376	0	0	0	400	0	0	4	0	0	0	0	0	207	987
Midland	5,978	6,055	0	0	0	1	0	0	0	0	0	0	0	11,996	24,030
Mitchell	0	0	1	0	0	13,413	0	0	0	0	0	0	0	17	13,431
Pecos	94,824	0	40,771	0	0	0	0	0	0	0	4,271	3,206	0	11,975	155,047
Reagan	20,918	0	0	0	0	78	0	0	0	0	0	0	0	3,730	24,726
Reeves	6,625	0	44,873	0	0	2,332	0	0	0	0	3,014	0	372	3,691	60,907
Runnels	13	0	0	29	0	0	0	0	0	0	0	0	0	3,267	3,309
Schleicher	2,978	0	0	0	0	0	0	0	0	0	0	0	0	7	2,985
Scurry	0	0	0	0	0	6,981	0	0	0	0	0	0	0	56	7,037
Sterling	460	0	69	0	0	7	0	0	0	0	0	0	0	469	1,005
Sutton	2,167	0	0	0	0	0	0	0	0	0	0	0	0	182	2,349
Tom Green	1,657	0	0	25,065	0	0	0	0	0	0	0	0	0	16,413	43,135
Upton	6,868	116	1	0	0	117	0	0	0	0	0	0	0	5,063	12,165
Ward	0	0	6,989	0	0	35	0	0	0	0	2	0	0	922	7,948
Winkler	2	0	9,364	0	0	1,473	0	0	0	0	0	0	0	549	11,388
Total	181,958	66,130	103,297	27,736	15,589	25,048	971	279	17	9	7,288	3,206	372	78,472	510,372

a. "Other" Aquifer category is the sum of groundwater pumping from aquifers not listed and unknown sources of pumping
Note: Data are from the Texas Water Development Board.[9]

The GCDs are also required to participate in joint groundwater planning through Groundwater Management Areas (GMAs). There are 16 GMAs in the State of Texas whose boundaries generally coincide with major aquifers. Each GMA is tasked with determining Desired Future Conditions for the aquifers in the management area for planning purposes. There are four GMAs that include one or more counties in Region F: GMA-7, GMA-3, GMA-2, and GMA-8 (Figure 1-17). Additional information on GCDs, the GMA process, and groundwater availability is included in Chapter 3.

In areas, where no there is no GCD, the state may designate a Priority Groundwater Management Area (PGMA). The Priority Groundwater Management Area (PGMA) process is initiated by the TCEQ, who designates a PGMA when an area is experiencing critical groundwater problems, or is expected to do so within 25 years. These problems include shortages of surface water or groundwater, land subsidence resulting from groundwater withdrawal, or contamination of groundwater supplies. Once an area is designated a PGMA, landowners have two years to create a Groundwater Conservation District (GCD). Otherwise, the TCEQ is required to create a GCD or to recommend that the area be added to an existing district. The TWDB works with the TCEQ to produce a legislative report every two years on the status of PGMAs in the state. The PGMA process is completely independent of the current Groundwater Management Area (GMA) process and each process has different goals. The goal of the PGMA process is to establish GCDs in these designated areas so that there will be a regulating entity to address the identified groundwater issues. PGMAs are still relevant as long as there remain portions within these designated areas without GCDs. There is one PGMA in Region F, the Reagan, Upton, and Midland County PGMA as shown in Figure 1-18.

There have been previous efforts to create GCDs in Upton and Midland Counties. In November 1991, landowners in Midland County attempted to join the Permian Basin UWCD, but were unsuccessful. In 1999, House Bill 437 proposed to expand the authority of the existing Upton County Water District, and subsequently failed.

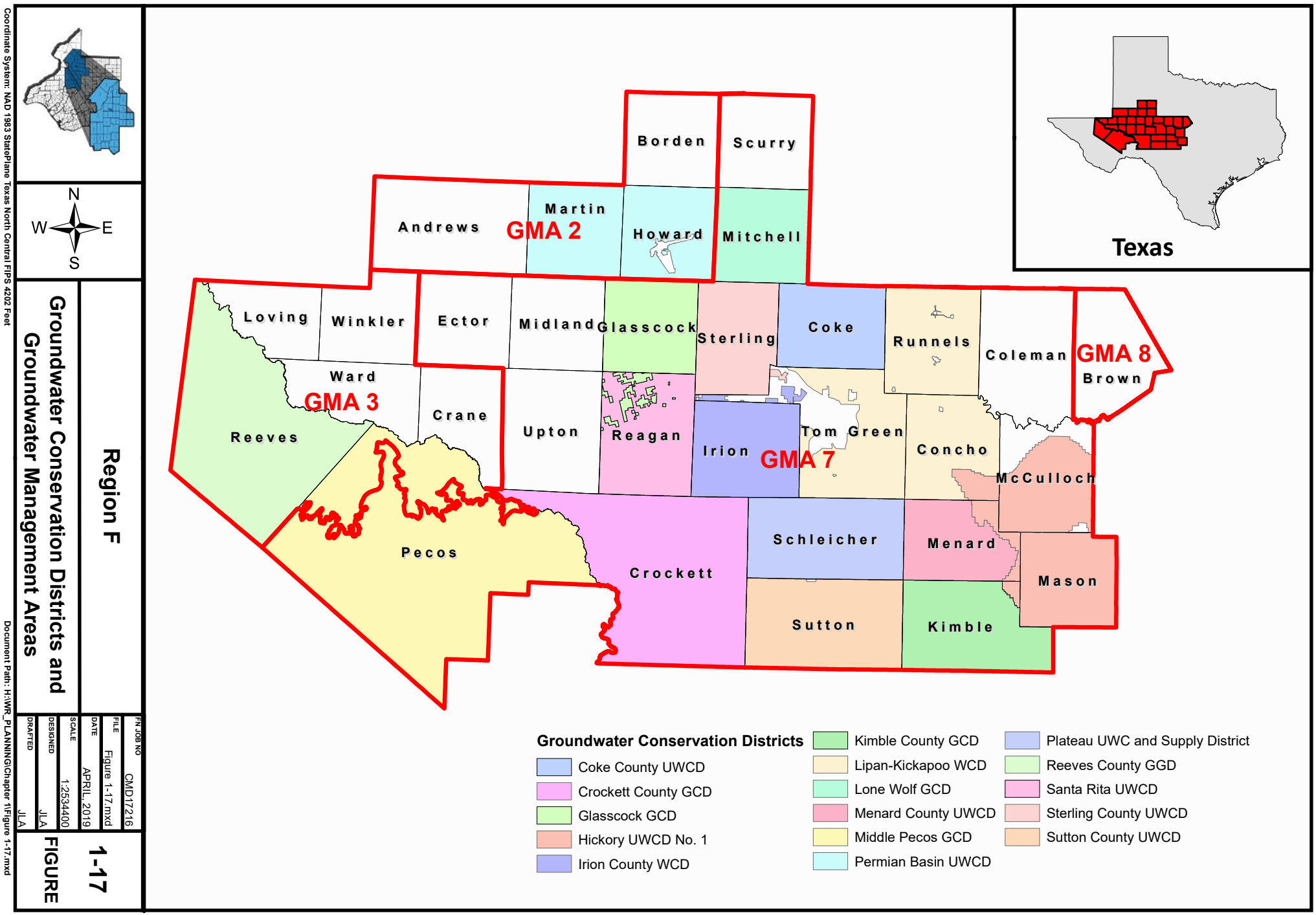
The Santa Rita UWCD (created in 1989) includes all but 65,000 acres of Reagan County, which were incorporated into the existing Glasscock GCD in 1989 and 1990, when landowners petitioned to join the Glasscock GCD. The Reagan, Upton and Midland County PGMA was designated in 1990. The name of the PGMA is somewhat of a misnomer because it only includes portions of Midland and Upton Counties as shown in Figure 1-16. All portions of Reagan County are included in either Glasscock or Santa Rita GCD.

The TCEQ Executive Director is authorized to petition the Commission to establish groundwater management in PGMAs in areas that have no GCD. The Executive Director of the TCEQ published a final report in February 2017 addressing the options available to the portions of Midland and Upton Counties that are located within the PGMA boundary[11].

These options included:

1. Adding PGMA-bound portions of both counties to the Glasscock GCD,
2. Adding PGMA-bound portions of both counties to the Santa Rita GCD,
3. Add the PGMA-bound portion of Midland County to the Glasscock GCD and add the PGMA-bound portion of Upton County to the Santa Rita GCD,
4. Create a new and separate GCD for the portions in both counties, or
5. Create two new GCDs for the portions in both counties splitting the GCDs at the county line.

In this report, the Executive Director recommended that the TCEQ issue an order for option 1 due to its feasible, practical, and economic benefits for landowners in the PGMA to secure groundwater management of the Edwards-Trinity Plateau Aquifer. As of this time, no order has been issued by TCEQ and no county commissioner's court has promulgated groundwater regulations or availability values for areas within the PGMA that have no GCD. However, TCEQ administrative actions will continue for the establishment of groundwater management in these areas and the matter is proceeding to the contested case process at the State Office of Administrative Hearings[7].


Borden
Scurry
Andrews
Martin
GMA 2
Howard
Mitchell
Texas
Loving
Winkler
Ector
Midland
Glasscock
Sterling
Coke
Runnels
Coleman
GMA 8
Brown
Ward
GMA 3
Crane
Upton
Reagan
Irion
GMA 7
Tom Green
Concho
McCulloch
Reeves
Pecos
Crockett
Schleicher
Menard
Mason
Sutton
Kimble
Groundwater Conservation Districts
Coke County UWCD
Crockett County GCD
Glasscock GCD
Hickory UWCD No. 1
Irion County WCD
Kimble County GCD
Lipan-Kickapoo WCD
Lone Wolf GCD
Menard County UWCD
Middle Pecos GCD
Permian Basin UWCD
Plateau UWC and Supply District
Reeves County GGD
Santa Rita UWCD
Sterling County UWCD
Sutton County UWCD
N
W
E
S
Region F
Groundwater Conservation Districts and Groundwater Management Areas
FIGURE 1-17
FN JOB NO CMD17216
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SCALE 1:2534400
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Coordinate System: NAD 1983 StatePlane Texas North Central FIPS 4202 Feet
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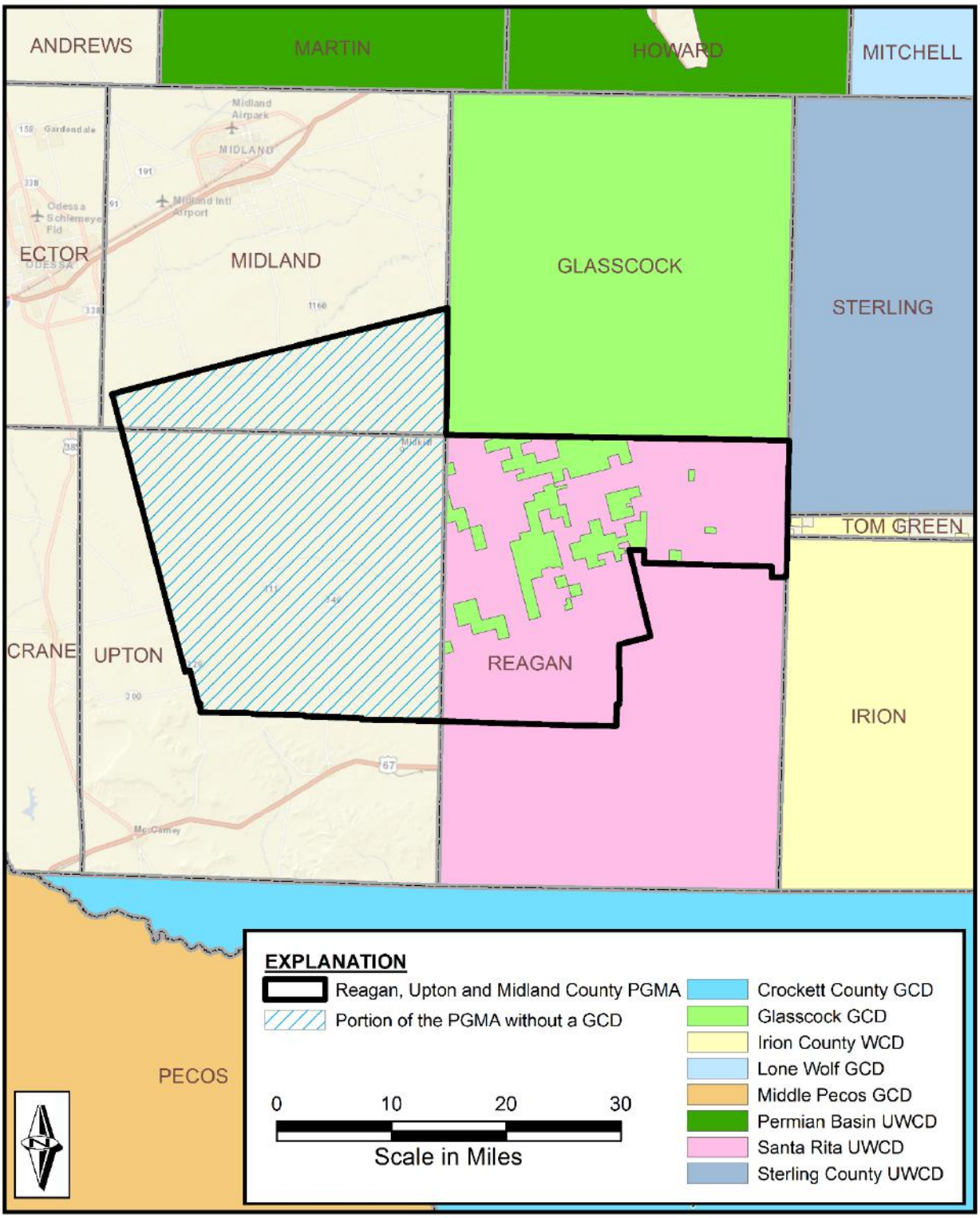
Figure 1-18
Reagan, Upton, and Midland County PGMA Boundary (Source: TCEQ)



1.3.3 Springs in Region F

Springs in Region F have been important sources of water supply since prehistoric times and have had great influence on early transportation routes and patterns of settlement. However, groundwater development and the resulting water level declines have caused some springs to disappear over time and have greatly diminished the flow from many of those that remain. Even though spring flows are declining throughout the region due to groundwater development, brush infestation, and climatic conditions, many springs are still important sources of water. Several rivers in Region F have significant spring-fed flows, including tributary creeks to the Concho and the San Saba Rivers, which are directly or indirectly used for municipal and irrigation purposes in the region.

Many springs are also important to the region for natural resources purposes. The Diamond Y Springs in northern Pecos County stopped flowing in 2018, but have maintained very low discharge volumes since that occurred. The Balmorhea spring complex in southern Reeves County flow continuously and are important habitat for endangered species. Also in Pecos County, the historically significant Comanche Springs flow occasionally during winter months when there is less stress on the underlying aquifer.

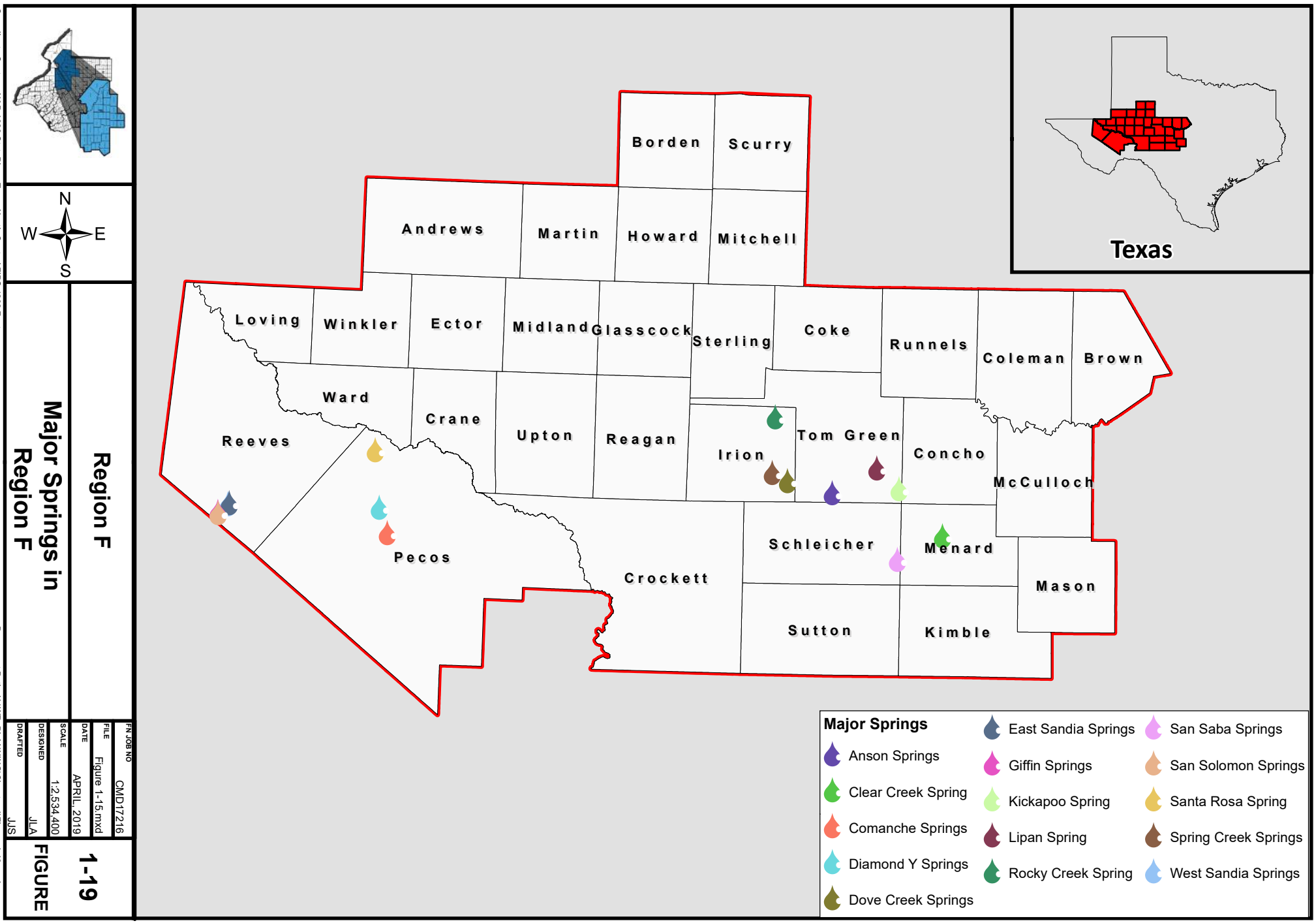
The Region F Planning Group has identified 14 major springs in the region that are important for water supply or natural resources protection. These major springs include: San Solomon, Giffin, and Sandia Springs in Reeves County; Comanche, Santa Rosa, and Diamond Y Springs in Pecos County; Spring Creek Springs, Dove Creek Springs, and Rocky Creek Springs in Irion County; Anson Springs, Lipan Spring, and Kickapoo Spring in Tom Green County; Clear Creek Spring in Menard County; and San Saba Spring in Schleicher County. Figure 1-19 contains a map of the major springs in Region F. For convenience, the following spring descriptions are grouped into related geographic areas. Discussions pertaining to the historical significance of these springs are taken from *Springs of Texas*, by Gunner Brune.[12,13]

Balmorhea Area Springs

Springs in the Balmorhea area have supported agricultural cultures for centuries. Early native Americans dug acequias to divert spring-water to crops. In the nineteenth century several mills were powered by water from the springs. The Reeves County Water Control and Improvement District No. 1 was formed in 1915 and provides water, mostly from San Solomon Springs, to irrigated land in the area. The springs are also used for recreational purposes at the Balmorhea State Park, and are the home of rare and endangered species, including the Comanche Springs pupfish, which was transplanted here when flow in Comanche Springs at Fort Stockton became undependable. Three major springs are located in and around the community of Balmorhea: San Solomon Springs, Giffin Springs, and East and West Sandia Springs. A fourth spring, Phantom Spring, is located in Jeff Davis County (Region E) a short distance west of Balmorhea. Below average rainfall in the area over the past decade has resulted in diminishing flows from these springs.

San Solomon Springs are located in the large swimming pool in Balmorhea State Park and are the largest spring in Reeves County. The spring's importance begins with its recreational use in the pool, then its habitat for endangered species in the ditches leading from the pool,[14] and finally its irrigation use downstream, where water from these springs is used to irrigate approximately 10,000 acres of farmland. These springs, which were once known as Mescalero or Head Springs, issue from lower Cretaceous limestones that underlie surface gravels in the area. Spring flow is maintained by precipitation recharge in the nearby Davis Mountains to the south. Discharge from San Solomon Springs is typically between 25 and 30 cubic feet per second (cfs). After strong rains, the spring flow often increases rapidly and becomes somewhat turbid. These bursts in spring flow are typically short-lived.

Giffin Springs are located across the highway from Balmorhea State Park and are at the same elevation as San Solomon Springs. Giffin Springs are smaller than, but very similar to, San Solomon Springs. Water discharging from these springs is used for irrigation, and typically averages between three and four cubic feet per second. Discharge from Giffin Springs responds much more closely to precipitation than the other Balmorhea-area springs.



Major Springs in Region F

Region F

FIGURE 1-19

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FILE	Figure 1-15.mxd
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Coordinate System: NAD 1983 StatePlane Texas North Central FIPS 4202 Feet

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East and West Sandia Springs are located about one mile east of Balmorhea at an elevation slightly lower than San Solomon and Giffin Springs. Flow from this spring system was classified as a "stream segment with significant natural resources" in the first regional plan. They are ecologically significant due to the presence of the Pecos Gambusia and the Pecos Sunflower, and the only known naturally occurring populations of the Comanche Springs pupfish.[15] East Sandia Springs are about twice as large as the West Sandia Springs located approximately one mile farther up the valley. Together these two springs were called the Patterson Springs in 1915 by the U.S. Army Corps of Engineers. East and West Sandia Springs flow from alluvial sand and gravel, but the water is probably derived from the underlying Cretaceous Comanchean limestone. Discharge is typically between one and three cfs. The Nature Conservancy manages the 246-acre Sandia Springs Preserve to sustain the unique spring habitat and its vulnerable species.

Fort Stockton Area Springs

Comanche Springs flows from a fault fracture in the Comanchean limestone. This complex of springs includes as many as five larger springs and eight smaller springs in and around Rooney Park. These springs were historically very important, serving as a major crossroads on early southwestern travel routes. It is because of their historical significance and their continued ecotourism importance to the City of Fort Stockton, that this spring system is considered a major spring. The development of irrigated farming in the Belding area 12 miles to the southwest has intercepted natural groundwater flow, and by the early 1960s Comanche Springs had ceased to flow continuously. However, since 1987, Comanche Springs has sporadically flowed, primarily during winter months.

Diamond Y Springs (or Deep Springs) is the largest spring system in Pecos County, and provides aquatic habitat for rare and endangered species. The springs are one of the largest and last remaining cienega (desert marshland) systems in West Texas. These springs are located north of Fort Stockton, and issue from a deep hole in Comanchean limestone, approximately sixty feet in diameter. The chemical quality of the spring water suggests that its origin may be from the deeper Rustler aquifer. This spring is one of the last places the Leon Springs pupfish can be found, and is also home for the Pecos Gambusia. The Texas Nature Conservancy maintains conservation management of the Diamond Y Springs. The springs stopped flowing in 2018, but have maintained very low discharge volumes since that occurred.

Santa Rosa Spring is located in a cavern southwest of the City of Grandfalls. At one time this spring provided irrigation water. Spring flow ceased in the 1950s.

San Angelo Area Springs

Six springs/spring-fed creeks located within approximately twenty miles of San Angelo are identified as major springs. Four of these springs, including Dove Creek Springs, Spring Creek Springs, Rocky Creek Springs, and Anson Springs, form the primary tributaries that feed into Twin Buttes Reservoir, which is a water supply source for the City of San Angelo. Two other springs, Lipan Spring and Kickapoo Spring, do not feed into Twin Buttes, but instead flow into the Concho River downstream from San Angelo.

Dove Creek Springs are located at the head of Dove Creek in Irion County about eight miles southwest of Knickerbocker. The perennial springs flow an average of 9 cfs and contribute to surface flow destined for Twin Buttes Reservoir. The landowners of these springs have placed the river corridor surrounding the springs into a Conservation Reserve Program so as to protect aquatic and other wildlife as well as vegetation species.

Anson Springs (or Head of the River Springs) are located on ranchland approximately five miles south of Christoval in Tom Green County. Perennial spring flow in the bed and banks of the South Concho River results in an average discharge of more than 20 cfs. This spring flow sustains the South Concho River, which has major irrigation diversion permits dating back to the early 1900s. The environment surrounding the springs is a sensitive eco-system with diverse flora and fauna found only in this specific location. The landowners of the springs have placed the river corridor of their property where the springs are located into a Conservation Reserve Program to protect vegetation and aquatic life as well as other wildlife.

Spring Creek Springs (also known as Seven, Headwaters, or Good Springs) are located on Spring Creek in eastern Irion County approximately three miles south of the town of Mertzon. Besides evidence of significant occupation by early American Indians, the U.S. Cavalry also used the springs in the late 1840s. This was the last fresh water spring on the route westward.

Rocky Creek Springs are located on West Rocky Creek in northeastern Irion County, four to five miles northwest of the town of Arden.

Lipan Spring is located approximately 15 miles southeast of San Angelo and was a stop on the old Chihuahua Road. This spring, which issues from Edwards limestone, has historically flowed at less than one cfs.

Kickapoo Spring also discharges from Edwards limestone and is located approximately twelve miles south of Vancourt. This spring was used for irrigation in the early days of settlement and historically has flowed between 1 and 4 cfs.

Fort McKavett Area Springs

San Saba Springs (or Government or Main Springs) are located at the headwaters of the San Saba River, were on the Chihuahua Road from the Port of Indianola to Mexico, and were the water supply for Fort McKavett, established in 1852.

Clear Creek Springs (or Wilkinson Springs) form the headwaters of Clear Creek, which contributes significant flow to the upper reaches of the San Saba River in Menard County. The old San Saba Mission was located near these springs from 1756 to 1758. The springs were also a stop on the Chihuahua Road.

1.4 Agricultural and Natural Resources in Region F

1.4.1 Endangered or Threatened Species

Table 1-12 is a compilation of federal and state threatened and endangered species found in Region F counties. Section 7 of the Federal Endangered Species Act requires federal agencies to consult with the U.S. Fish and Wildlife Services (USFWS) to ensure that any action they authorize, fund, or carry out will not jeopardize listed species. Under Section 9 of the same act, it is unlawful for a person to "take" a listed species. Under the federal definition "take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or attempt to engage in any such conduct." Included in the definition of harm are habitat modifications or degradation that actually kills or injures a species or impairs essential behavioral patterns such as breeding, feeding or sheltering.[16] There are nine federal and sixteen state species listed as endangered that are known to, or may occur, in counties in Region F. The Northern Aplomado Falcon, Whooping Crane, and Rio Grande Silvery Minnow are the federally listed endangered species most frequently cited in Table 1-12 for counties in Region F. The Black-capped Viero and Pecos Gambusia are the state listed endangered species most frequently cited in Table 1-12 for counties in Region F.

Table 1-12
Endangered and Threatened Species in Region F

Species		Status		County																															
Common Name	**Scientific Name**	**Federal**	**State**	**Andrews**	**Borden**	**Brown**	**Coke**	**Coleman**	**Concho**	**Crane**	**Crockett**	**Ector**	**Glasscock**	**Howard**	**Irion**	**Kimble**	**Loving**	**Martin**	**Mason**	**McCulloch**	**Menard**	**Midland**	**Mitchell**	**Pecos**	**Reagan**	**Reeves**	**Runnels**	**Schleicher**	**Scurry**	**Sterling**	**Sutton**	**Tom Green**	**Upton**	**Ward**	**Winkler**
Birds																																			
American Peregrine Falcon	*Falco peregrinus anatum*		T	S						S	S	S					S							S		S							S	S
Bald Eagle	*Haliaeetus leucocephalus*	R	T	B	B	B	B	B	B	B	S	B	B	B	B	B	F	B	B	B	B	B	B	S	B		B	B	B	B	S	B	B	B	B
Black-Capped Vireo	*Vireo atricapilla*	R	E				B	B	B		B		F	F	B	B			B	B	B		F	B	B		B	B		B	B	B	F		
Common Black-Hawk	*Buteogallus anthracinus*		T																													S			
Golden-Cheeked Warbler	*Setophaga chrysoparia*	E	E													B			B		F														
Lesser Praire-Chicken	*Falco femoralis septentrionalis*	C		F														F																	
Least Tern	*Sterna antillarum*	E																														F			
Mexican Spotted Owl	*Strix occidentalis lucida*	T																						F		F									
Northern Aplomado Falcon	*Tympanuchus pallidicinctus*	E		F								F					F							F		F								F	F
Piping Plover	*Charadrius melodus*	T			F																								F						
Red Knot	*Calidris canutus rufa*	T		F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Reddish Egret	*Egretta rufescens*		T																							S									
Sooty Tern	*Onychoprion fuscatus*		T				S																									S			
White-Faced Ibis	*Plegadis chihi*		T	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Whooping Crane	*Grus americana*	E	E			B		B										F	F	F															
Zone-Tailed Hawk	*Buteo albonotatus*		T			S	S		S		S		S		S	S			S	S	S	S		S	S	S		S		S	S	S	S		
Crustaceans																																			
Diminutive Amphipod	*Gammarus hyalelloides*	E	E														F							F		B								F	
Pecos Amphipod	*Gammarus pecos*	E	E																					B											
Fish																																			
Blue Sucker	*Cycleptus elongatus*		T	S		S	S	S	S	S	S	S	S	S			S			S			S	S		S	S	S	S		S	S	S	S	S
Clear Creek Gambusia	*Gambusia heterochir*		E																		B														
Comanche Springs Pupfish	*Cyprinodon elegans*		E																					S		B									
Devils River Minnow	*Dionda diaboli*		T								S																	S			S				
Leon Springs Pupfish	*Cyprinodon bovinus*		E																					B											
Pecos Gambusia	*Gambusia nobilis*		E							S	S													B		B									
Pecos Pupfish	*Cyprinodon pecosensis*		T							S	S						S							S		S							S	S	S
Proserpine Shiner	*Cyprinella proserpina*		T							S	S													S	S						S	S	S		
Rio Grande Darter	*Etheostoma grahami*		T							S	S													S							S	S	S		
Rio Grande Silvery Minnow	*Hybognathus amarus*	E									F													F		F									
Sharpnose Shiner	*Notropis oxyrhynchus*	E																											F						
Smalleye Shiner	*Notropis buccula*	E			F																								F						
Mammals																																			
White-Nosed Coati	*Nasua narica*		T								S					S														S					
Reptiles																																			
Brazos Water Snake	*Nerodia harteri*		T				S	S	S											S			S			S					S				
Chihuahuan Desert Lyre Snake	*Trimorphodon vilkinsonii*		T								S																			S					
Chihuahuan Mud Turtle	*Kinosternon hirtipes murrayi*		T																										S						
Concho Water Snake	*Nerodia paucimaculata*	R				F	F	F	F											F			F			F					F				
Mountain Short-Horned Lizard	*Phrynosoma hernandesi*		T																										S						
Reticulate Collared Lizard	*Crotaphytus reticulatus*		T								S																								
Texas Horned Lizard	*Phrynosoma cornutum*		T	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Texas Tortoise	*Gopherus berlandieri*		T			S		S								S															S				
Trans-Pecos Black-Headed Snake	*Tantilla cucullata*		T																					S											
Lloyd's Mariposa Cactus	*Echinomastus mariposensis*																							F											

Species		Status		County																															
Common Name	**Scientific Name**	**Federal**	**State**	**Andrews**	**Borden**	**Brown**	**Coke**	**Coleman**	**Concho**	**Crane**	**Crockett**	**Ector**	**Glasscock**	**Howard**	**Irion**	**Kimble**	**Loving**	**Martin**	**Mason**	**McCulloch**	**Menard**	**Midland**	**Mitchell**	**Pecos**	**Reagan**	**Reeves**	**Runnels**	**Schleicher**	**Scurry**	**Sterling**	**Sutton**	**Tom Green**	**Upton**	**Ward**	**Winkler**
Pecos Sunflower	*Helianthus paradoxus*	T	T																					B		B									
Texas Poppy-Mallow	*Callirhoe scabriuscula*	R	E				B																B				B		S						
Tobusch Fishhook Cactus	*Sclerocactus brevihamatus ssp. tobuschii*	T	E													B																			
Mollusks																																			
Diamond Y Springsnail	*Pseudotryonia adamantina*		E																					B											
False Spike Mussel	*Fusconaia mitchelli*	C	T			F		F	B							B			B	B	B						F	F			F				
Gonzales Tryonia	*Tryonia circumstriata*		E																					B											
Pecos Assiminea Snail	*Assiminea pecos*		E																					B		B									
Phantom Springsnail	*Pyrgulopsis texana*		E																							B									
Phantom Tryonia	*Tryonia cheatumi*		E																					S		B									
Smooth Pimpleback	*Quadrula houstonensis*	C	T			B	F	S	B							F			S	S	S						S								
Texas Fatmucket	*Lampsilis bracteata*	C	T			F	B	B	B		F				B	B			B	B	B						B	B			B	B			
Texas Fawnsfoot	*Truncilla macrodon*		T			S		S	S						S	S			S	S	S						S					S			
Texas Hornshell	*Popenaias popeii*		T							S	S						S							S		S								S	
Texas Pimpleback	*Cyclonaias petrina*	C	T			B		B	B							S			B	B	B		F				B	F		B	F	B			

***Status:**
T - Threatened
E - Endangered
R - Recovery
C - Candidate

Key:
F - Federal listings only (US Fish and Wildlife Service. 2019. Endangered Species List. http://www.fws.gov/endangered/)[16]
S - State listings only (Texas parks and Wildlife Department. 2019. Annotated County Lists of Rare Species. http://tpwd.texas.gov/gis/rtest/)[17]
B - both Federal and State listings

The Texas Endangered Species Act gives the Texas Parks and Wildlife Department (TPWD) the authority to establish a list of fish and wildlife that are endangered or threatened with statewide extinction. As defined by the statute, "fish and wildlife" excludes all invertebrates except mollusks and crustaceans. No person may capture, trap, take, or kill or attempt to capture, trap, take, or kill listed fish and wildlife species without a permit. Plants are not protected by these provisions. Endangered, threatened or protected plants may not be taken from public land for commercial sale or taken from private land for commercial purposes without a permit. Laws and regulations pertaining to endangered or threatened animal species are contained in Chapters 67 and 68 of the Texas Parks and Wildlife (TPW) Code and Sections 65.171 - 65.184 of Title 31 of the Texas Administrative Code (T.A.C.). Laws and regulations pertaining to endangered or threatened plant species are contained in Chapter 88 of the TPW Code and Sections 69.01 - 69.14 of the T.A.C.

The Texas Endangered Species Act does not protect wildlife species from indirect take (e.g., destruction of habitat or unfavorable management practices). The TPWD has a Memorandum of Understanding with every state agency to conduct a thorough environmental review of state initiated and funded projects, such as highways, reservoirs, land acquisition, and building construction, to determine their potential impact on state endangered or threatened species. There are 44 species identified by the state as threatened or endangered that are known to, or may potentially occur in Region F.

1.4.2 Agriculture and Prime Farmland

Agriculture plays a significant role in the economy of Region F. Table 1-13 provides basic data regarding agricultural production in Region F.[18] Region F includes approximately 22,342,000 acres in farms and over 2,420,000 acres of potential cropland. In 2017, the market value of agriculture products (crops and livestock) for Region F was over $717,000,000, with livestock accounting for approximately 50 percent of the total.

Figure 1-20 shows the distribution of prime farmland in Region F.[19] The National Resources Conservation Service (NRCS) defines prime farmland as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses". As part of the National Resources Inventory, the NRCS has identified prime farmland throughout the country. Each color in Figure 1-20 represents the percentage of the total acreage that is considered prime farmland of any kind.

Table 1-13
2017 U.S. Department of Agriculture County Census Data for Region F

Category	Andrews	Borden	Brown	Coke	Coleman	Concho	Crane	Crockett
Farms	156	127	1,838	449	976	396	30	219
Irrigated Land (acres)	12,823	2,214	4,080	749	709	4,265	(D)	13
Land in Farms (acres)								
- Crop Land[a]	78,257	90,753	76,623	42,989	146,339	108,538	222	6,266
- Pasture Land	805,283	396,182	364,878	410,458	472,806	417,448	243,832	1,514,135
- Other	3,225	7,494	105,267	15,856	53,136	35,011	41	13,705
- Total	886,765	494,429	546,768	469,303	672,281	560,997	244,095	1,534,106
Market Value ($1,000)								
- Crops	$5,128	$17,039	$9,245	$1,253	$13,354	$13,389	(D)	(D)
- Livestock	$5,487	$11,749	$36,725	$6,586	$16,988	$14,730	(D)	(D)
- Total	$10,615	$28,788	$45,970	$7,839	$30,342	$28,119	(D)	(D)

Category	Ector	Glasscock	Howard	Irion	Kimble	Loving	Martin	Mason
Farms	275	175	373	175	602	8	356	680
Irrigated Land (acres)	881	39,669	6,925	923	8,506	(D)	12,227	3,935
Land in Farms (acres)								
- Crop Land[a]	1,891	180,347	148,291	4,349	15,535	(D)	298,913	21,761
- Pasture Land	548,732	311,171	342,072	594,105	700,515	467,485	136,372	457,747
- Other	7,266	4,696	30,600	14,193	84,590	(D)	9,273	59,905
- Total	557,889	496,214	520,963	612,647	694,230	468,140	444,558	539,413
Market Value ($1,000)								
Crops	$256	$47,444	$20,266	$301	(D)	(D)	$52,494	$2,316
Livestock	$3,126	$3,201	$6,600	$8,974	$6,709	(D)	$1,804	$19,363
Total	$3,382	$50,645	$26,866	$9,275	$6,709	(D)	$54,298	$21,679

a. Crop land is the land that is currently or recently cultivated for farming. Acreages in active farms may be less.

Table 1-13 (Cont'd)
2017 U.S. Department of Agriculture County Census Data for Region F

Category	McCulloch	Menard	Midland	Mitchell	Pecos	Reagan	Reeves	Runnels
Farms	682	346	410	362	309	112	224	833
Irrigated Land (acres)	1,936	1,152	7,404	3,039	12,887	8,098	8,138	5,563
Land in Farms (acres)								
- Crop Land[a]	83,660	10,541	75,819	153,108	50,780	55,572	54,659	256,203
- Pasture Land	443,595	469,138	239,436	419,021	(D)	652,405	996,558	392,384
- Other	35,855	27,888	29,733	10,888	(D)	28,355	12,682	23,717
- Total	563,110	507,567	344,988	583,017	2,867,712	736,332	1,063,899	672,304
Market Value ($1,000)								
Crops	$6,856	$567	$13,013	$13,584	$24,371	$11,947	$5,175	$31,877
Livestock	$15,635	$8,505	$3,326	$8,158	$21,793	$6,256	$5,716	$21,557
Total	$22,491	$9,072	$16,339	$21,742	$46,164	$18,203	$10,891	$53,434

Category	Schleicher	Scurry	Sterling	Sutton	Tom Green	Upton	Ward	Winkler	Total
Farms	327	560	76	261	1,303	98	102	46	12,886
Irrigated Land (acres)	1,412	5,509	411	341	19,604	15,778	3,276	(D)	192,467
Land in Farms (acres)									
- Crop Land[a]	30,559	201,705	9,421	12,412	125,014	74,922	6,457	(D)	2,421,906
- Pasture Land	777,107	312,248	574,488	851,546	668,092	(D)	396,350	479,950	15,855,539
- Other	3,316	16,851	381	36,906	19,779	(D)	2,983	(D)	693,592
- Total	810,982	530,804	584,290	900,864	812,885	725,139	405,790	489,230	22,341,711
Market Value ($1,000)									
Crops	$3,439	$24,361	(D)	$131	$29,864	$13,873	(D)	(D)	361,543
Livestock	$14,351	$20,791	(D)	$10,219	$70,166	$5,190	$1,361	(D)	355,066
Total	$17,790	$45,152	(D)	$10,350	$100,030	$19,063	$1,361	(D)	716,609

a. Crop land is the land that is currently or recently cultivated for farming. Acreages in active farms may be less.
NOTES: (D) – Data withheld to avoid disclosing data for individual farms.
Total Market Value amounts include value of crops and livestock listed as (D) (data withheld).
Source: Data are from the U.S. Department of Agriculture (USDA, 2017).[18]