

Summary of the 2016 Region F Regional Water Plan¹

Texas' regional water plans

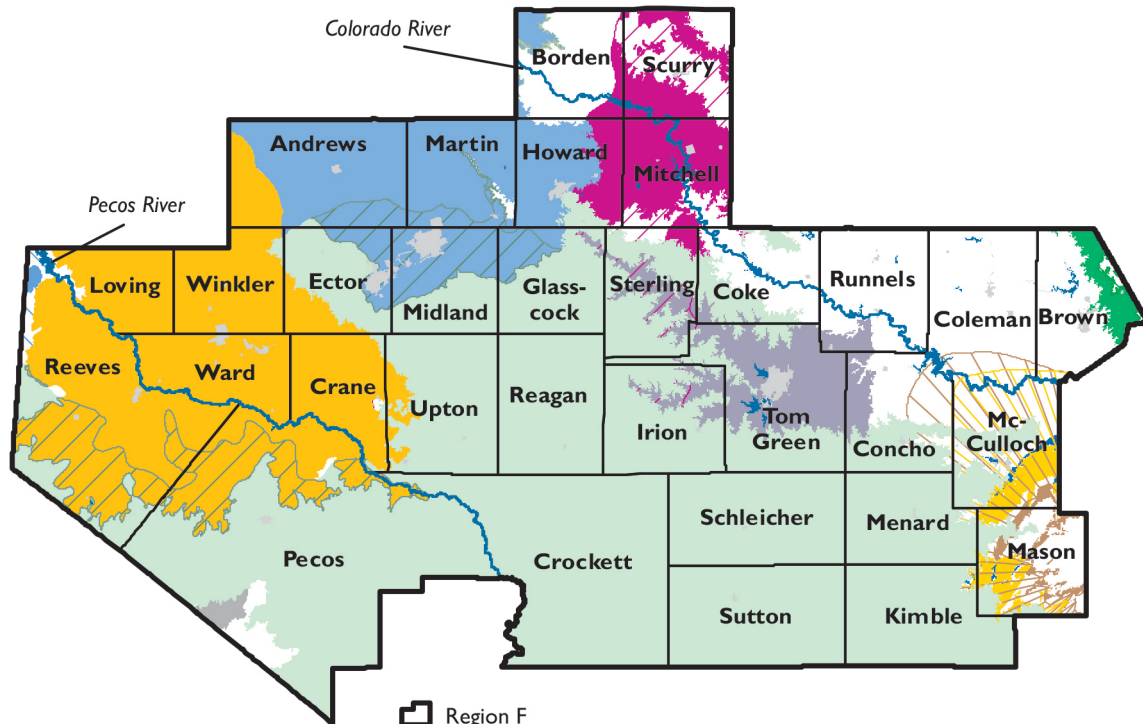
Regional water plans are funded by the Texas Legislature and developed every five years based on conditions that each region would face under a recurrence of a historical drought of record. The 16 regional water plans are developed by local representatives in a public, bottom-up process. The regional plans are reviewed and approved by the TWDB and become the basis for the state water plan. Regional and state water plans are developed to

- provide for the orderly development, management, and conservation of water resources,
- prepare for and respond to drought conditions, and
- make sufficient water available at a reasonable cost to ensure public health, safety, and welfare and further economic development while protecting the agricultural and natural resources of the entire state.

The Region F Regional Water Planning Area encompasses 32 counties in west central Texas from the Edwards Plateau to the Permian Basin (Figure F.1). The vast majority of the region lies within the Colorado River and Rio Grande basins. The Edwards-Trinity Plateau, Pecos Valley, and Ogallala aquifers provide the largest supplies of groundwater. The largest economic sectors in the region are the oil and gas industry, healthcare, manufacturing, and agriculture. Major cities in the region include Midland, Odessa, and San Angelo. The 2016 Region F Regional Water Plan can be found on the TWDB website at <http://www.twdb.texas.gov/waterplanning/rwp/plans/2016/#region-f>

¹ Planning numbers presented throughout this document and as compared to the 2017 Interactive State Water Plan may vary due to rounding.

Figure F.1 - Region F regional water planning area



- Region F
- Major rivers
- Cities
- Existing reservoirs
- Capitan Reef Complex Aquifer*
- Dockum Aquifer (outcrop)*
- Dockum Aquifer (subsurface)*
- Edwards-Trinity (Plateau) Aquifer (outcrop)
- Edwards-Trinity (Plateau) Aquifer (subsurface)
- Edwards-Trinity (High Plains) Aquifer*
- Ellenburger-San Saba Aquifer (outcrop)*
- Ellenburger-San Saba Aquifer (subsurface)*
- Hickory Aquifer (outcrop)*
- Hickory Aquifer (subsurface)*
- Lipan Aquifer (outcrop)*
- Marble Falls Aquifer*
- Ogallala Aquifer
- Pecos Valley Aquifer
- Rustler Aquifer (outcrop)*
- Rustler Aquifer (subsurface)*
- Trinity Aquifer (outcrop)
- Trinity Aquifer (subsurface)
- Igneous Aquifer*

* Minor aquifer (only shown where there is no major aquifer).

Plan highlights

- Additional supply needed in 2070—237,000 acre-feet per year
- Recommended water management strategy volume in 2070—212,000 acre-feet per year
- 145 recommended water management strategy projects with a total capital cost of \$1.20 billion
- Conservation accounts for 48 percent of 2070 strategy volumes
- Innovative technologies, including direct potable reuse, aquifer storage & recovery, and groundwater desalination, account for 7 percent of 2070 strategy volumes.

Population and water demands

Approximately 2 percent of the state's 2020 population will reside in Region F. Between 2020 and 2070, the region's population is projected to increase 43 percent (Table F.4, Figure F.2). By 2070, the total water demands for the region are projected to increase 2 percent (Table F.4).

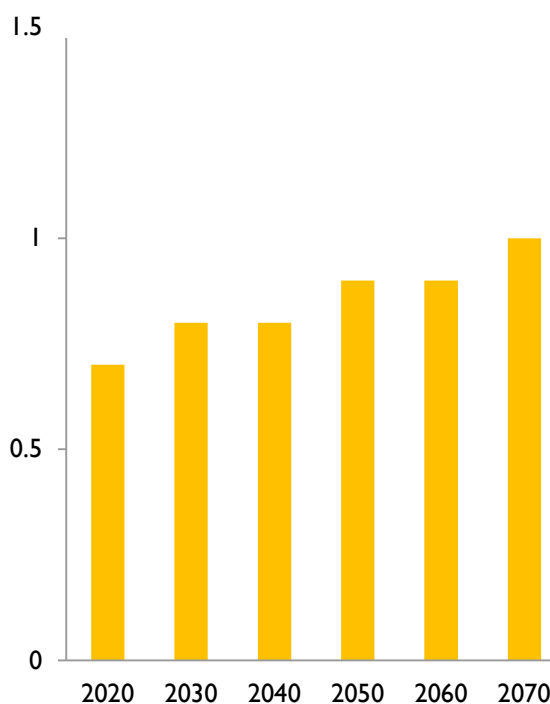
Existing water supplies

More than 80 percent of the existing water supply in Region F is associated with groundwater (Table F.1, Figure F.3). By 2070 the total water supply is projected to decline 6 percent (Table F.4), primarily as a result of reservoir sedimentation and reduced availability from the Ogallala Aquifer.

Needs

On a region-wide basis, Region F has water supply deficits from 2020 through 2070, with the majority of needs associated with irrigated agriculture (Table F.4). In the event of drought, Region F is projected to have a total water supply need of 183,000 acre-feet in 2020 (Table F.4). A relatively small volume of municipal needs remain unmet in the region, however an unmet need does not prevent an associated entity from pursuing development of additional water supply.

Figure F.2 - Projected population for 2020–2070 (in millions)



Recommended water management strategies and cost

The Region F Planning Group recommended a variety of water management strategies and projects that would provide less water than is required to meet future needs (Figures F.4 and F.5, Tables F.2 and F.3). In all, the 291 strategies and 145 projects would provide 212,000 acre-feet of additional water supply by the year 2070 at a total capital cost of \$1.20 billion.

Conservation

Conservation strategies represent 48 percent of the total volume of water associated with all recommended strategies in 2070. Over two-thirds of this volume is associated with irrigation demand reduction. Municipal conservation is recommended for all discrete municipal water users. It is also recommended for all county-other (rural municipal) water users with a water use above the statewide target of 140 gallons per capita per day.

Table F.1 - Existing water supplies for 2020 and 2070 (acre-feet per year)

Water supply source	2020	2070
Surface water		
Balmorhea Lake/Reservoir	22,000	22,000
Colorado River MWD Lake/Reservoir System	18,000	15,000
Red Bluff Lake/Reservoir	16,000	16,000
Remaining surface water sources providing less than 2% each	42,000	41,000
Surface water subtotal:	98,000	94,000
Groundwater		
Edwards-Trinity-Plateau Aquifer	217,000	199,000
Pecos Valley/Edwards-Trinity (Plateau) Aquifer	127,000	124,000
Ogallala Aquifer	65,000	55,000
Lipan Aquifer	45,000	45,000
Other Aquifer	20,000	19,000
Pecos Valley Aquifer	19,000	19,000
Dockum Aquifer	19,000	19,000
Hickory Aquifer	17,000	16,000
Remaining groundwater sources providing less than 2% each	11,000	10,000
Groundwater subtotal:	540,000	506,000
Reuse	19,000	19,000
Region total	657,000	619,000

Figure F.3 - Share of existing water supplies by water source in 2020

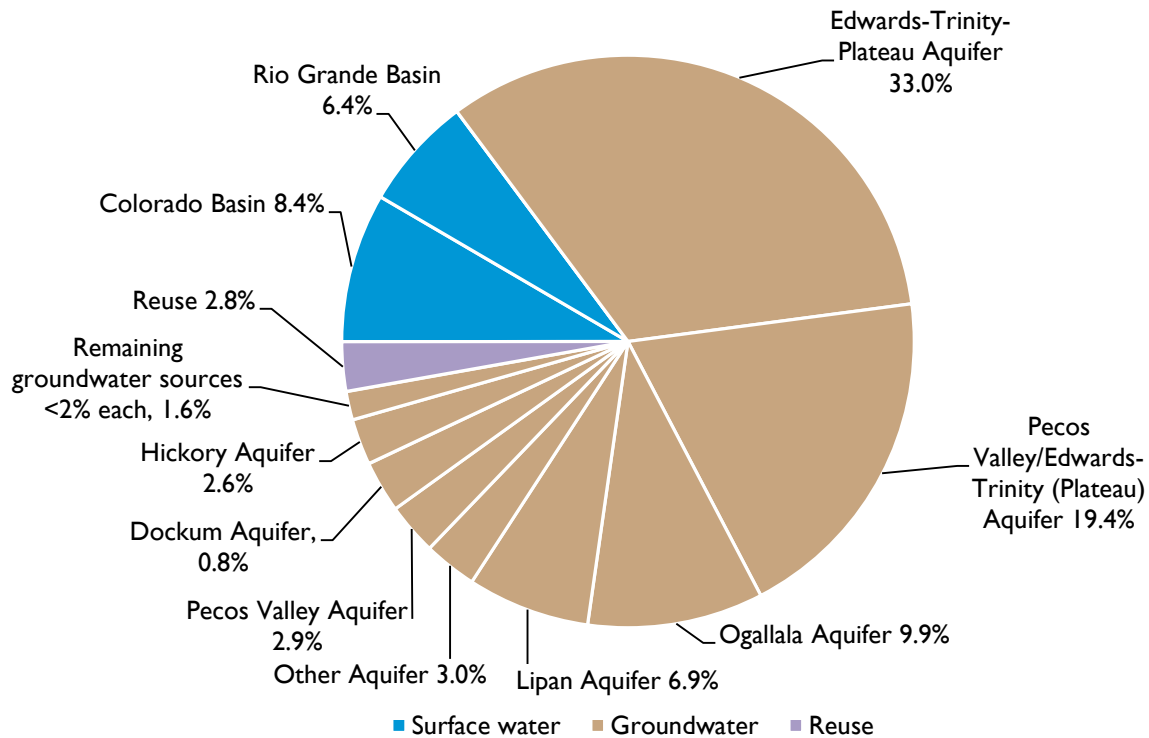


Table F.2 - Ten recommended water management strategy projects with largest capital cost

Recommended water management strategy project	Online decade	Sponsor(s)	Associated capital cost
Direct and/or Indirect Reuse for Municipal Use - San Angelo	2020	San Angelo	\$150,000,000
Ward County Well Field Expansion and Development of Winkler County Well Field - CRMWD	2020	Colorado River MWD	\$139,916,000
Develop Pecos Valley Aquifer Supplies - Midland County-Other	2030	County-Other, Midland	\$62,699,000
RO Treatment of Existing Supplies	2020	Odessa	\$62,309,000
Desalination of Other Aquifer Supplies in Tom Green County - San Angelo	2050	San Angelo	\$57,967,000
Steam Electric Power Conservation - Ector County SEP	2020	Steam Electric Power, Ector	\$56,090,000
Additional T-Bar Ranch Supplies With Treatment - Midland	2030	Midland	\$52,199,000
Steam Electric Power Conservation - Coke County SEP	2020	Steam Electric Power, Coke	\$50,490,000
Voluntary Transfer (Purchase) - Ballinger	2020	Ballinger	\$47,093,000
West Texas Water Partnership - San Angelo	2030	San Angelo	\$39,175,000
<i>Other recommended projects</i>	<i>various</i>	<i>135 various</i>	<i>\$482,719,000</i>
		Total capital cost	\$1,200,657,000

Table F.3 - Ten recommended water management strategies with largest supply volume

Recommended water management strategy name	Population served by strategy*	Number of water user groups served	Supply in acre-feet per year in 2070
Subordination - CRMWD System	541,000	15	24,000
Irrigation Conservation - Pecos County	na	1	19,000
SEP Conservation - Alternative Cooling Technologies - Ector County	na	1	15,000
Irrigation Conservation - Reeves County	na	1	13,000
Irrigation Conservation - Tom Green County	na	1	11,000
Additional T-Bar Ranch Supplies With Treatment - Midland	196,000	1	10,000
Ward County Well Field Expansion and Development of Winkler County Well Field - CRMWD	502,000	9	9,000
Weather Modification	na	10	7,000
Reuse - San Angelo	163,000	3	7,000
Cedar Ridge Reservoir	359,000	4	6,000
<i>Other recommended strategies</i>		244	88,000
		Total annual water volume	209,000

* Multiple strategies may serve portions of the same population

Table F.4 - Population, existing water supplies, demands, needs, and strategies 2020–2070 (acre-feet per year)

	Decade	2020	2030	2040	2050	2060	2070	change
Population		701,000	767,000	825,000	885,000	944,000	1,003,000	43%
Existing supplies	Surface water	98,000	97,000	96,000	95,000	94,000	94,000	-4%
	Groundwater	541,000	540,000	532,000	522,000	511,000	506,000	-6%
	Reuse	19,000	19,000	19,000	19,000	19,000	19,000	0%
	Total water supplies	657,000	656,000	647,000	636,000	625,000	619,000	-6%
Demands	Municipal	125,000	133,000	141,000	151,000	160,000	171,000	37%
	County-other	17,000	18,000	19,000	20,000	22,000	23,000	35%
	Manufacturing	11,000	12,000	13,000	13,000	14,000	15,000	36%
	Mining	56,000	56,000	46,000	34,000	24,000	19,000	-66%
	Irrigation	594,000	590,000	585,000	581,000	577,000	573,000	-4%
	Steam-electric	19,000	21,000	24,000	27,000	32,000	36,000	89%
	Livestock	17,000	17,000	17,000	17,000	17,000	17,000	0%
	Total water demand	838,000	847,000	846,000	844,000	846,000	853,000	2%
Needs	Municipal	34,000	43,000	53,000	63,000	73,000	83,000	144%
	County-other	2,000	2,000	3,000	4,000	4,000	5,000	150%
	Manufacturing	4,000	4,000	4,000	5,000	5,000	6,000	50%
	Mining	16,000	15,000	10,000	5,000	3,000	1,000	-94%
	Irrigation	114,000	113,000	111,000	111,000	112,000	110,000	-4%
	Steam-electric	14,000	16,000	19,000	22,000	26,000	31,000	121%
	Livestock	<500	<500	<500	<500	<500	<500	0%
	Total water needs	183,000	194,000	201,000	211,000	224,000	237,000	30%
Strategy supplies	Municipal	48,000	54,000	59,000	67,000	69,000	75,000	56%
	County-other	4,000	5,000	5,000	6,000	6,000	7,000	75%
	Manufacturing	3,000	3,000	4,000	4,000	5,000	6,000	100%
	Mining	13,000	13,000	11,000	10,000	7,000	6,000	-54%
	Irrigation	37,000	63,000	82,000	82,000	82,000	82,000	122%
	Steam-electric	20,000	21,000	24,000	28,000	32,000	36,000	80%
	Livestock	1,000	1,000	1,000	1,000	1,000	1,000	0%
	Total strategy supplies	126,000	160,000	185,000	196,000	202,000	212,000	68%

Figure F.4 - Volume of recommended water management strategies by water resource (thousands of acre-feet per year)

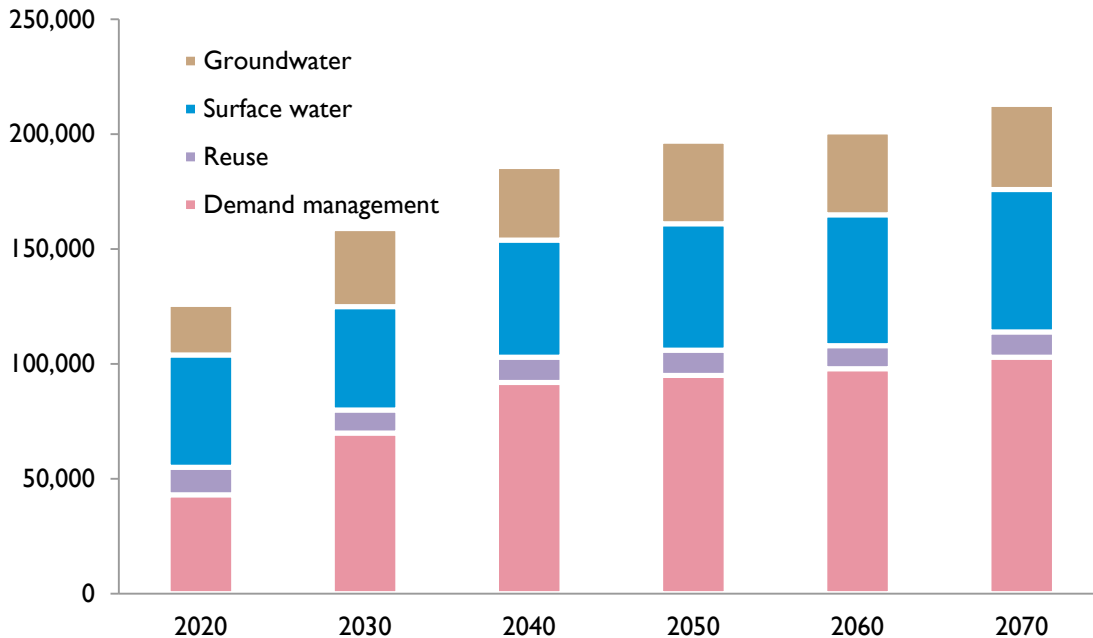
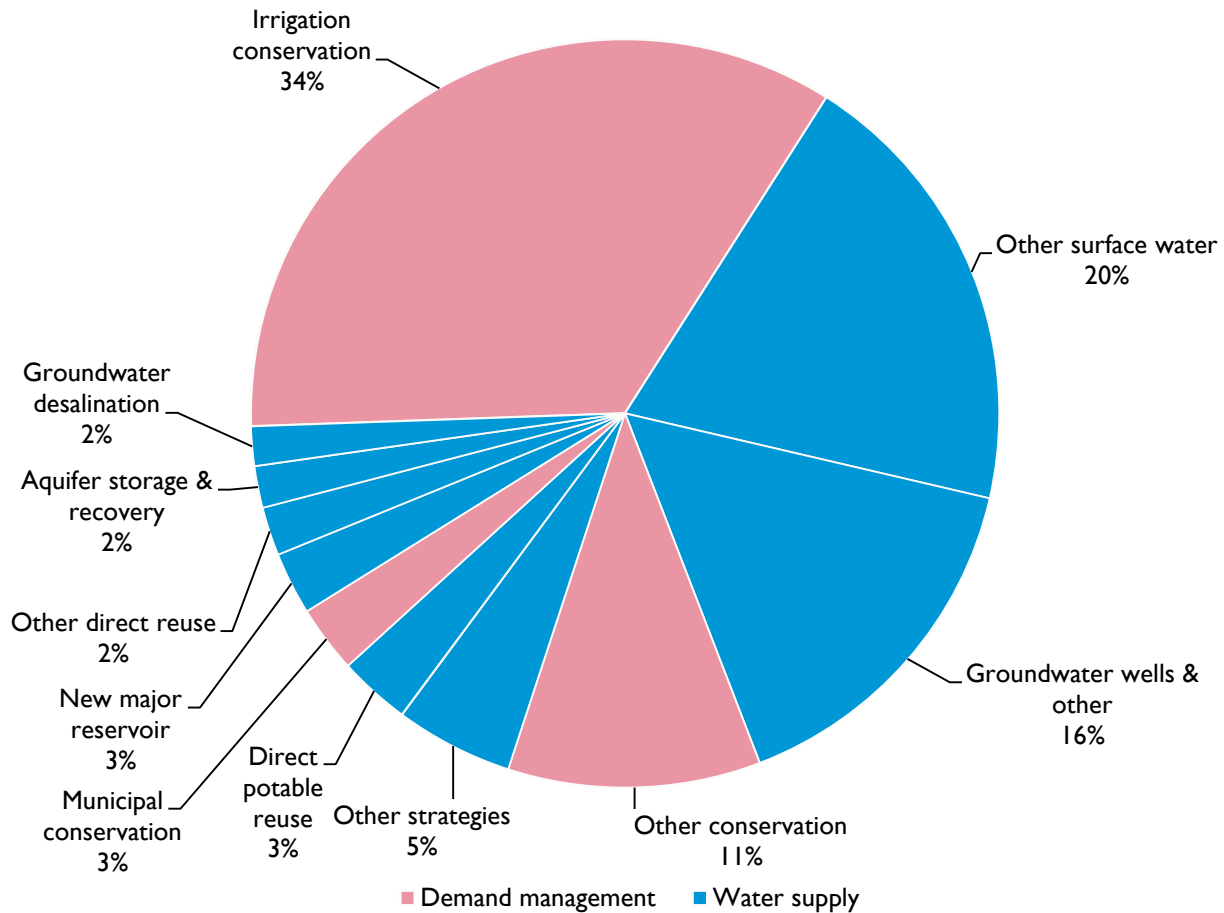


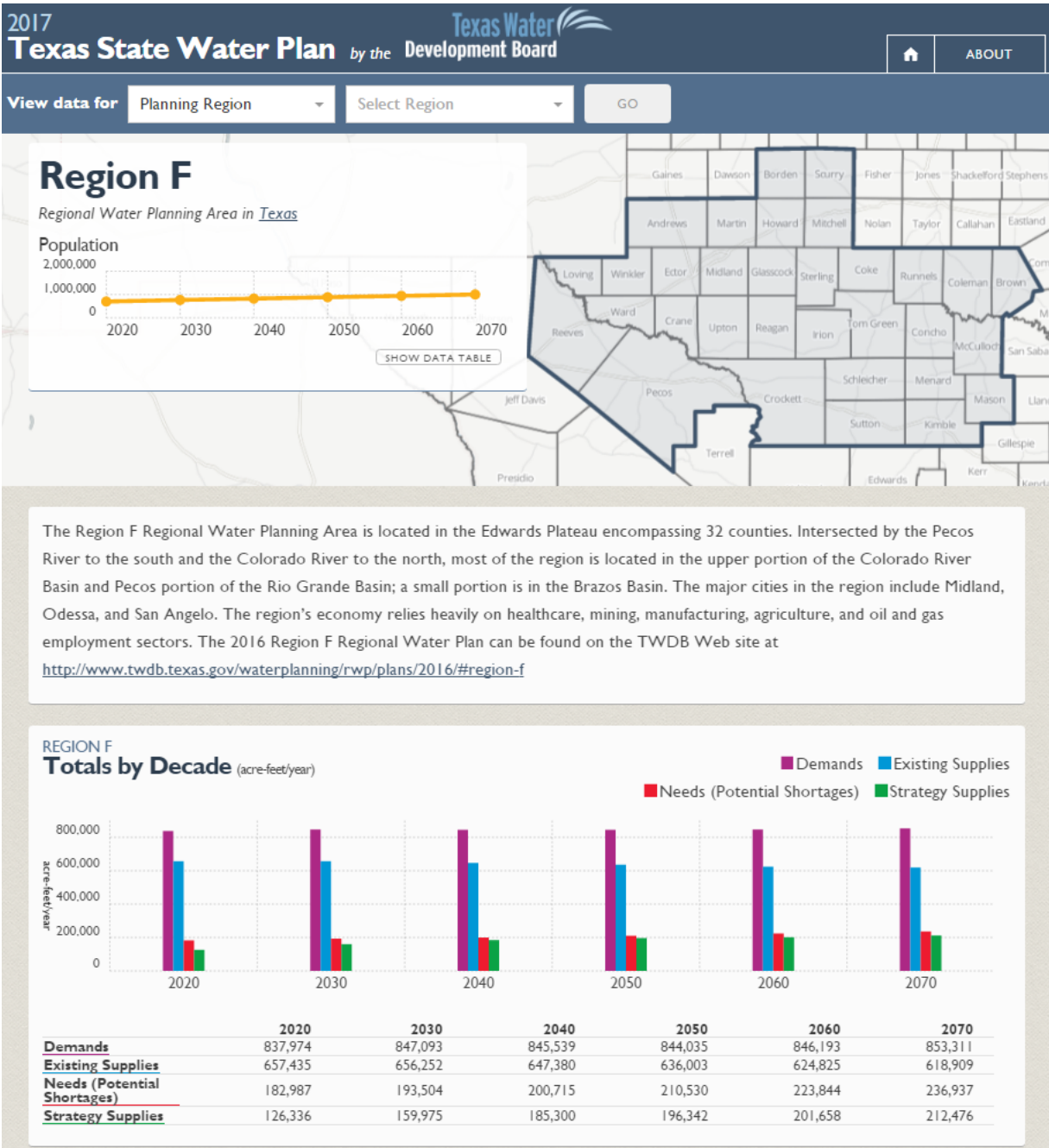
Figure F.5 - Share of recommended water management strategies by strategy type in 2070



Region F voting planning group members (2012 – 2016)

John Grant, water districts (Chair); Woody Anderson, agriculture; Mark Barr, counties; Jerry Bearden, counties; Stephen Brown, river authorities; Ricky Dickson, municipalities; Kenneth Dierschke, agriculture; Richard Gist, water utilities; Charles Hagood, small business; Scott Holland, groundwater management areas; Wendell Moody, public; Robert Moore, counties; Caroline Runge, environment; Terry Scott, agriculture; John Shepard, municipalities; Ben Shepperd, industry; Raymond Straub Jr., groundwater management areas; Merle Taylor, municipalities; Larry Turnbough, water districts; Gilbert Van Deventer, environment; Tim Warren, electric-generating utilities; Paul Weatherby, groundwater management areas; Will Wilde, municipalities; Len Wilson, public

For more information on Texas or specific regions, counties, or cities, please visit the 2017 Interactive State Water Plan website: texasstatewaterplan.org



Texas Water Development Board
1700 North Congress Avenue,
Austin, Texas 78701
512-463-7847
www.twdb.texas.gov