

## **CHAPTER 2**

### **WATER DEMAND WITHIN WFA'S SERVICE AREA**

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#### **1.1 Overview**

The WFA service area is located within one of the most rapidly growing regions of California. The warmer temperature that is characteristic of this interior area of southern California impacts the amount of water needed to meet the growing needs of WFA's member agencies as does the type of development and the level of water efficiency that is incorporated into future construction.

This chapter describes WFA's service area characteristics, including climate, population, land use and water usage including projected levels of water conservation by its member agencies. For more detailed information on area's population, land use and water use trends, please refer to Chapters 2 and 3 of the IEUA 2010 UWMP.

#### **2.1 Service Area Geography and Climate**

WFA's service area covers about 135 square miles within the upper Santa Ana River watershed. The service area is located within the boundary of the Chino Basin at the west end of San Bernardino County. This is an alluvial valley that is relatively flat from east to west and slopes along a north south grade. The service area is bounded to the north by the San Gabriel Mountains and on the west by the Chino Hills. The principal drainage within the Chino Basin is the Santa Ana River which flows along the southern Chino boundary to the Prado Flood Control Reservoir where it is eventually discharged through the outlet at Prado Dam and ultimately to the Pacific Ocean.

WFA's service area is located within the desert climate zone of southern California. The region receives an average annual rainfall of about 15 inches. Monthly average temperature ranges from a low of 67 degrees in January to a high of 95 degrees in July. Daily records show summer temperature has been as high as 114 degrees. During the fall and winter, dry Santa Ana winds can greatly impact the need for landscape irrigation. Table 2-1 shows monthly average evapotranspiration (ET<sub>o</sub>), rainfall and temperature within the service area.

**Table 2-1  
WFA Service Area Climate<sup>1</sup>**

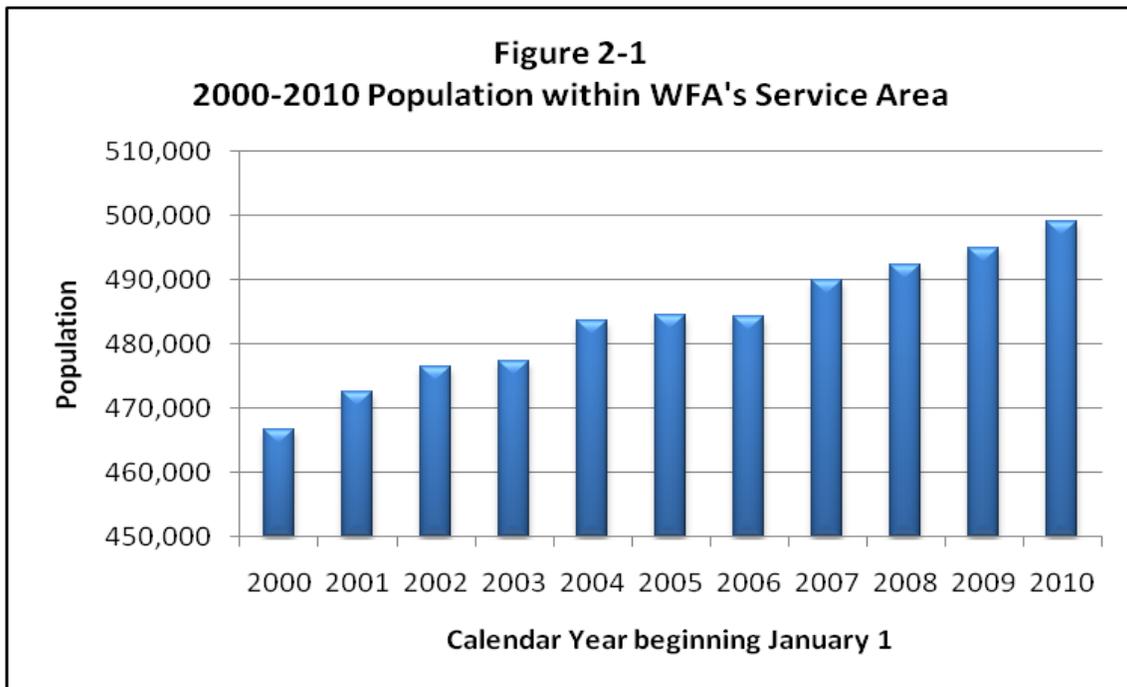
	Jan	Feb	Mar	Apr	May	June	
Standard Monthly Average Eto	2	2.28	3.43	4.62	4.99	6.04	
Average Rainfall (inches)	3.65	2.85	2.8	1.13	0.26	0.04	
Average Temperature (F°)	66.8	69.4	70.1	74.5	79.9	86.7	
	July	Aug	Sept	Oct	Nov	Dec	Annual
Standard Monthly Average Eto	6.98	6.97	5.27	3.96	2.65	2.06	51.25
Average Rainfall (inches)	0.01	0.11	0.34	0.34	1.72	2.07	15.32
Average Temperature (F°)	95	94.4	91.3	83	73.6	68.3	79.4

<sup>1</sup>Data provided by NOAA and CIMIS websites

As described in the IEUA 2010 UWMP, per capita water usage within San Bernardino County is higher than in San Diego, Orange County or Los Angeles Counties. This can be largely attributed to climate differences, with San Bernardino County experiencing much warmer temperatures than the comparatively cooler areas located closer to the ocean.

## 2.2 Past Population and Water Use

WFA’s service area has experienced rapid growth over the past ten years (see Figure 2-1). Population within the service area was approximately 467,000 in 2000. By 2005, the area had grown to a population of about 485,000 and by 2010 to an estimated population of almost 500,000.



The annual rate of increase over the ten year period has been about 1%. The City of Chino experienced the highest rate of growth during this time, with an estimated annual rate of increase of 2.1%. As shown in Table 2-2, the largest cities served within the WFA service area are Ontario, Chino and Chino Hills.

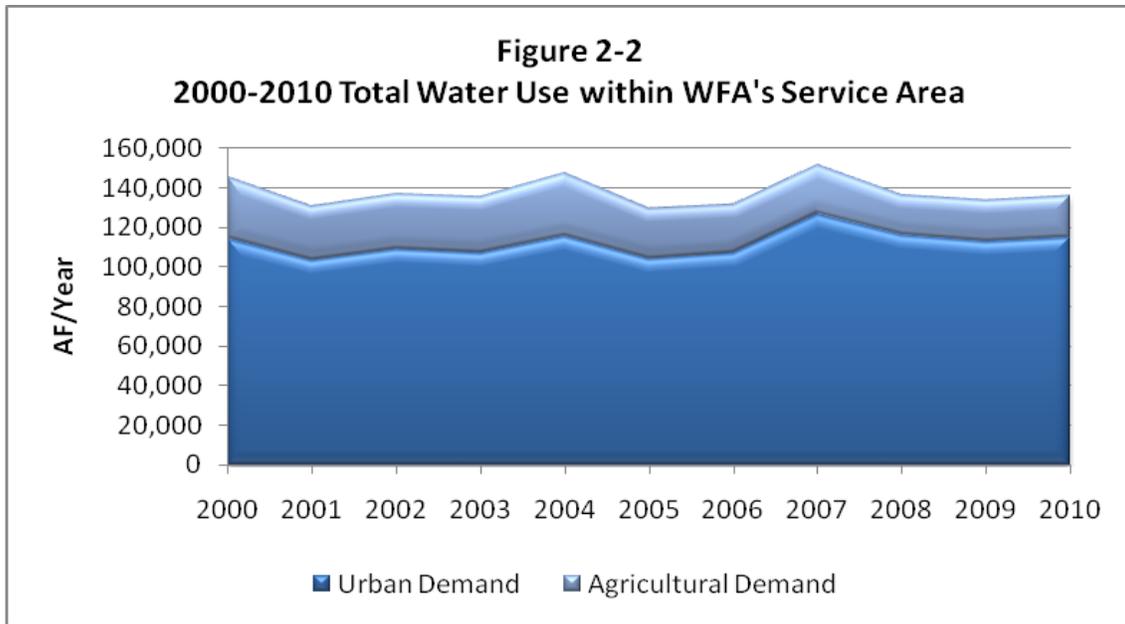
**Table 2-2  
WFA Service Area Population**

<b>Agency</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Chino	67,168	67,736	69,152	70,850	75,865	77,926
Chino Hills	66,787	68,545	71,394	73,211	76,584	77,699
Ontario	158,007	159,461	163,275	166,169	168,322	170,111
Upland	68,393	69,338	70,929	72,030	72,880	73,580
Montclair	48,281	49,214	50,148	50,650	51,244	52,222
Unincorporated	58,125	58,227	51,610	44,488	38,777	33,066
<b>Total</b>	<b>466,761</b>	<b>472,521</b>	<b>476,508</b>	<b>477,398</b>	<b>483,672</b>	<b>484,604</b>

<b>Agency</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Chino	79,795	81,165	82,481	84,053	84,742
Chino Hills	77,719	78,307	78,465	78,597	78,971
Ontario	170,567	171,911	172,608	172,908	174,536
Upland	73,860	74,823	74,668	74,914	76,106
Montclair	52,307	53,666	54,159	54,415	54,673
Unincorporated	30,000	30,000	30,000	30,000	30,000
<b>Total</b>	<b>484,248</b>	<b>489,872</b>	<b>492,381</b>	<b>494,887</b>	<b>499,028</b>

Note: the unincorporated population is an estimate for the 2006-2010.

Currently about 85% of the water use within WFA's service area is for urban (residential, commercial, industrial and institutional uses), as shown in Figure 2-2. The remaining 15% of the water has been used for agricultural purposes. All of the water used for urban purposes is distributed through the five retail agencies that serve the population within WFA's service area. Water used for agricultural purposes is pumped directly from private wells and is therefore not served through wholesale water provided by WFA.



The overall trend in the area’s water demand in the past ten years has essentially flat-lined. In 2007, the water demand peaked at approximately 151,000 acre-feet. However, in the last three years water demand has decreased (see Figure 2-2). The continuing downward trend in overall water use is an excellent indicator of how well the WFA member agencies have responded to the current water supply challenges including; a third consecutive year of drought, MWD’s call for stored water under the Chino Basin Dry Year Yield Program; Judge Wanger’s Delta Decision which significantly restricted diversions from the delta, the Governor’s declaration of a Statewide Water Emergency, MWD’s adoption of a Water Supply Allocation Plan and its call for both voluntary conservation and implementation of mandatory water conservation ordinances.

Despite the flat-lined water use trend over the past ten years, the annual demand within the area has fluctuated with dry and wet year cycles. The early 1990’s were characterized by an intense drought (1988-1992) that sharply increased demand and then, as a result of the region’s conservation efforts, decreased the area’s water usage. Similarly, dry conditions prevailed between 2007 and 2010, fiscal year 2007 being a record-breaking dry year for California with the Agency’s service area receiving less than 5 inches of rain – far below the 13-inch average rainfall for the region, and the region saw a short sharp increase in demand followed by a longer lasting decrease in demand.

As shown in Table 2-3, the retail agencies with the largest demand within the WFA service area in 2010 are city of Ontario (about 33,000 acre-feet per year), City of Upland (about 21,000 acre-feet per year) and the city of Chino Hills (about 16,000 acre-feet per year).

**Table 2-3  
2000-2010 Water Use within WFA's Service Area**

<b>Agency</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
City of Chino	15,764	14,463	15,447	15,006	16,037	15,012
City of Chino Hills	17,333	16,608	15,242	15,800	18,402	15,228
City of Ontario	46,420	40,340	43,836	43,349	46,146	42,632
City of Upland	23,038	20,289	22,496	20,864	22,563	19,847
Monte Vista Water District	11,924	11,735	12,026	12,036	12,448	11,418
<b>Urban Sub-Total</b>	<b>114,479</b>	<b>103,435</b>	<b>109,047</b>	<b>107,055</b>	<b>115,596</b>	<b>104,137</b>
Agricultural	44,242	39,285	38,196	35,168	38,192	31,505
<b>Total<sup>9</sup></b>	<b>158,721</b>	<b>142,720</b>	<b>147,243</b>	<b>142,223</b>	<b>153,788</b>	<b>135,642</b>

<b>Agency</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
City of Chino	15,786	20,181	20,329	20,876	15,601
City of Chino Hills	16,518	20,534	19,542	18,695	16,002
City of Ontario	42,219	49,868	43,720	40,973	33,188
City of Upland	21,024	23,806	20,261	22,144	20,841
Monte Vista Water District	11,517	12,375	12,330	10,114	10,085
<b>Urban Sub-Total</b>	<b>107,064</b>	<b>126,764</b>	<b>116,182</b>	<b>112,802</b>	<b>95,717</b>
Agricultural	30,253	29,653	23,539	23,277	21,043
<b>Total<sup>9</sup></b>	<b>137,317</b>	<b>156,417</b>	<b>139,721</b>	<b>136,079</b>	<b>116,760</b>

Within the urban sector, more than half (58%) of the water used within WFA's service area is for single family homes. The remaining demand is divided among non-residential (commercial/industrial) uses (20%), multi-family (11%) and unmetered uses and system losses (12%). These estimated uses for 2010 are unchanged from the estimated uses in 2005, and are consistent with uses within IEUA's service area as a whole (see IEUA 2010 UWMP, Chapter 2).

## **2.3 Future Population, Employment, Housing and Water Demand**

### **Population**

The population within IEUA's service area is expected to continue to grow over the next twenty-five years, however, when the expected growth actually occurs will depend on how long the economic recession lasts. The projected population for the area in 2035 is 726,773 people (Table 2-4). This represents an increase of almost 260,000 people over the next twenty-five years, with an average annual growth rate of about 4%.

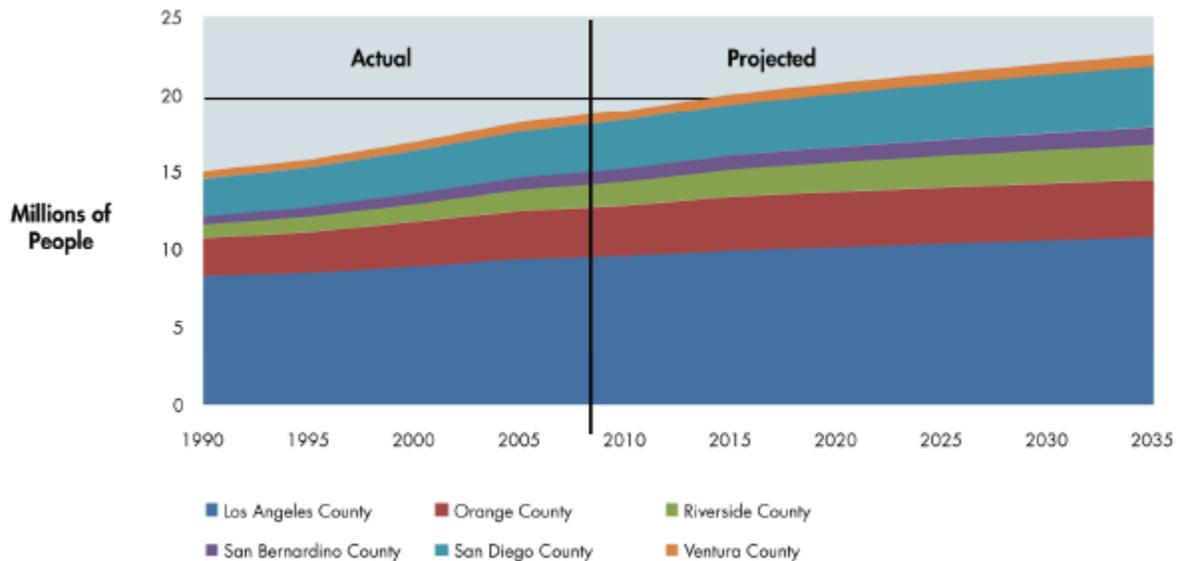
**Table 2-4  
Projected Population by Communities within WFA's Service Area**

	2000	2005	2010	2015	2020	2025	2030	2035
CHINO	67,168	77,926	84,742	90,737	106,053	121,369	136,686	136,686
CHINO HILLS	66,787	77,699	78,971	81,916	83,636	85,284	86,784	88,284
MONTE VISTA	45,454	49,164	51,471	54,784	57,942	61,045	64,046	66,933
ONTARIO	158,394	172,408	174,536	213,839	246,304	277,799	318,035	358,270
UPLAND	70,393	73,235	76,106	75,200	75,300	75,400	75,500	76,600
<b>Total</b>	<b>408,196</b>	<b>450,432</b>	<b>465,826</b>	<b>516,476</b>	<b>569,235</b>	<b>620,897</b>	<b>681,051</b>	<b>726,773</b>

Note: Data sources from local agencies UWMP's are variable and include Department of Finance, municipal planning departments and interpolation as further provided herein and in the IEUA 2010 UWMP and MWD RUWMP.

According to SCAG and SANBAG estimates, the population in MWD's service area will reach 18.9 million in 2010, 21.4 million in 2025, and 22.5 million by 2035 (Figure 2-3). While Los Angeles County leads in total population, the inland areas of Riverside and San Bernardino counties are projected to grow at the fastest rates over the next ten years. Generally speaking, however, annual growth rates will slow for all counties between 2010 and 2035. In part this is due to changing patterns of migration. It also reflects the effects of the recession of the late 2000's and the ongoing restructuring of the Southern California economy (MWD's 2010 RUWMP).

**Figure 2-3 Actual and Projected Population (MWD's 2010 UWMP)**



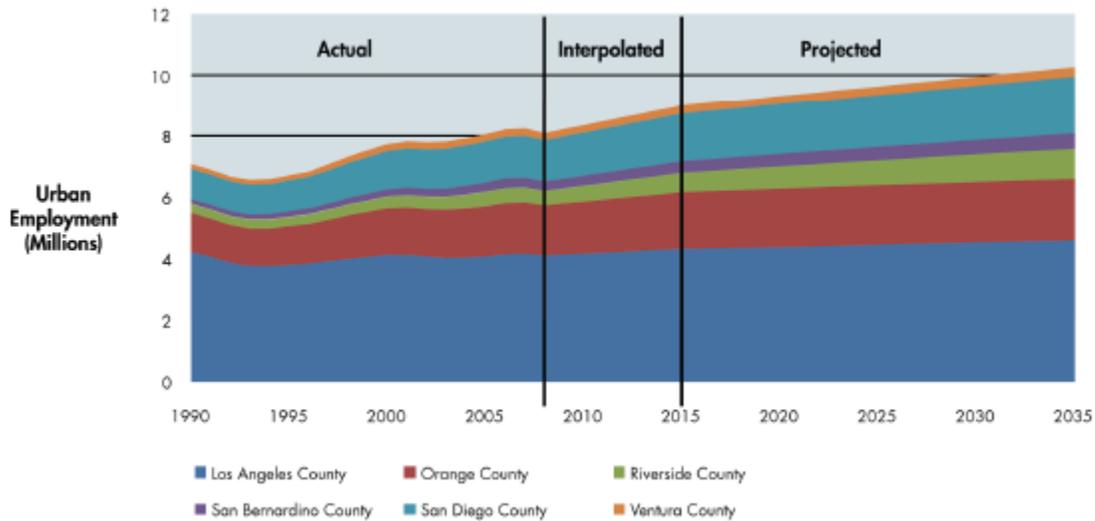
**Employment**

Economic trends are important drivers of water demand. MWD and IEUA capture economic trends by tracking regional employment growth and the changing mix of industries comprising the Southern California economy.

Unfortunately, regional job growth has slowed again in response to the economic recession that began in 2007. Southern California suffered more than most regions during this period due to the combination of housing and economic declines occurring during the post-2007 period. Within MWD’s service area, employment growth is likely to occur unevenly across the six counties. Over the twenty-five year period between 2010 and 2035, the greatest employment increases are expected to occur in Riverside, San Diego and Los Angeles Counties. However, relative to existing employment, Riverside and San Bernardino Counties are expected to have the highest growth rate for employment (MWD’s 2010 RUWMP).

Figure 2-4 summarizes the projected employment growth in each of MWD’s six counties. MWD’s overall service area is expected to increase by approximately 23% over the next twenty-five years. In comparison, San Bernardino County is expected to increase by over 52% over the same twenty-five year period.

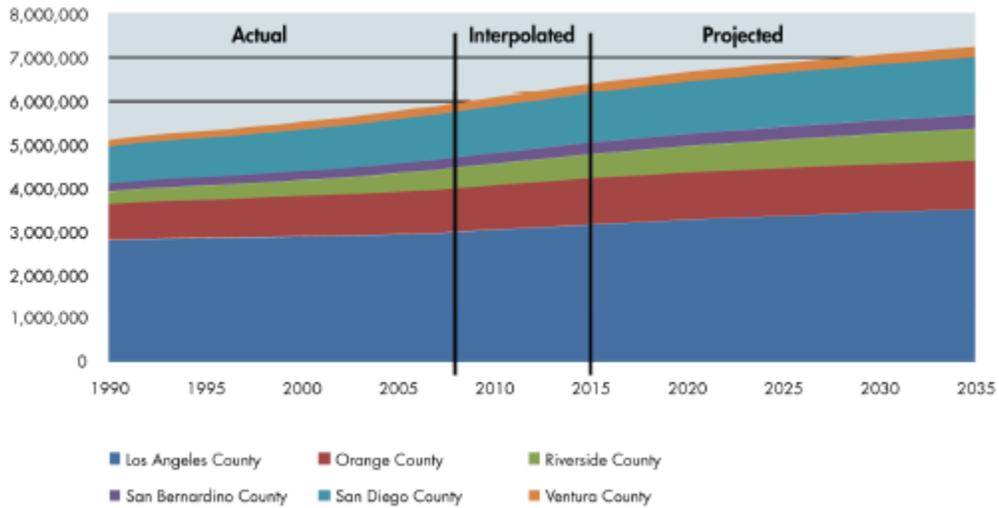
**Figure 2-4 Actual and Projected Urban Employment (MWD’s 2010 UWMP)**



## Residential Housing

Southern California regional planning agencies have forecast residential housing growth in all parts of the MWD service area. The total occupied housing stock is expected to increase more than 19% between 2010 and 2035. In comparison, San Bernardino County is expected to increase by approximately 34% during the same period (Figure 2-5). The effect of economic recessions can clearly be seen over time in conjunction with the fall in housing construction, the most recent occurring in 2007.

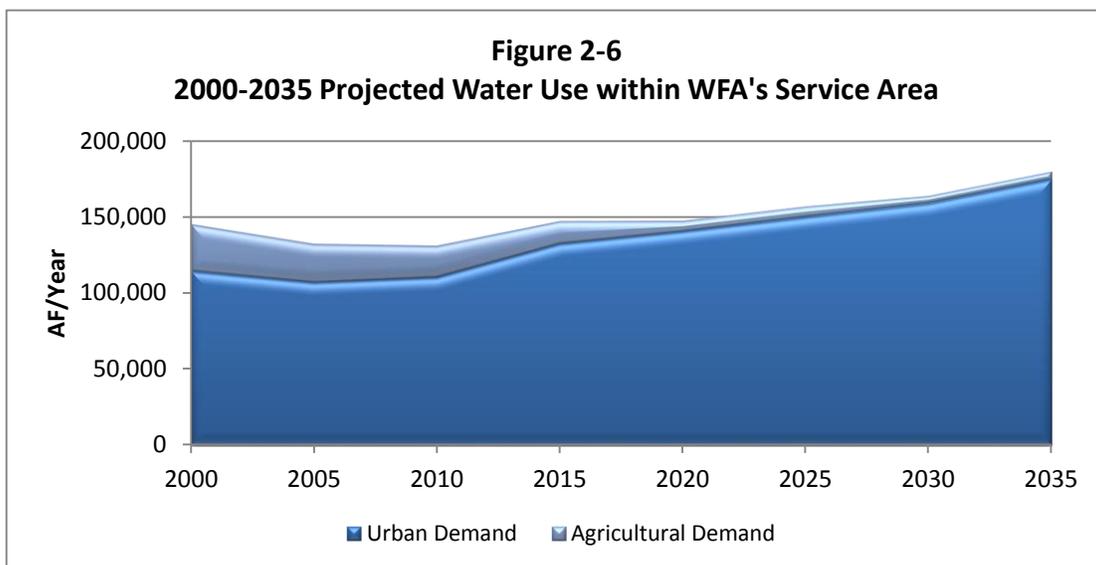
**Figure 2-5 Actual and Projected Households (MWD's 2010 UWMP)**



Employment within the service area is forecasted by the Southern California Association of Governments to increase by over 100,000 jobs in the next twenty years (see Figure 2-4). This corresponds to an average annual increase of almost 3%. Housing stock is expected to increase by a projected 76,000 occupied units, representing an average annual increase of 3.2%.

**Water Demand**

Based upon these future expected land uses, water used for agricultural purposes is expected to decline from 16% of the water demand to less than 3% of the demand, as shown in Figure 2-6.



Projected total water needs within WFA’s service area by 2035 are expected to increase by approximately 48,000 acre-feet (from about 131,000 acre-feet per year in 2010 to about 179,000 acre-feet in 2035). This represents a potential 37% increase in the area water needs if no additional improvements in local water use efficiency occur during the next twenty-five years, including no increase in state and/or federal regulatory standards for development and landscaping, and no implementation of new demand side management and conservation programs within WFA’s service area.

**Table 2-5  
Projected Water Use by WFA Member Agencies**

	2000	2005	2010	2015	2020	2025	2030	2035
City of Chino	15,396	15,012	15,601	16,602	17,401	18,874	19,954	20,990
City of Chino Hills	17,204	15,228	16,002	20,800	21,400	21,400	21,400	21,400
City of Ontario	42,903	42,632	33,188	44,413	49,647	54,889	60,127	70,966
City of Upland	23,038	19,847	20,841	20,330	20,330	20,330	20,330	20,330
Monte Vista Water District	11,924	11,418	10,085	12,100	11,140	11,440	11,690	12,020
<b>Subtotal</b>	<b>110,465</b>	<b>104,137</b>	<b>95,717</b>	<b>114,245</b>	<b>119,918</b>	<b>126,933</b>	<b>133,501</b>	<b>145,706</b>
<b>Recycled Water Demand</b>	4,015	2,814	14,569	18,065	20,612	23,059	25,506	29,103
<b>Agricultural Demand</b>	30,993	25,593	21,043	15,000	7,000	7,000	5,000	5,000
<b>Total Demand</b>	<b>145,473</b>	<b>132,544</b>	<b>131,329</b>	<b>147,310</b>	<b>147,530</b>	<b>156,992</b>	<b>164,007</b>	<b>179,809</b>

WFA and IEUA, as urban wholesale water suppliers, are not required to develop a baseline or set reduction targets to achieve a 20% reduction in gallons per capita day by 2020 as written under SB X 7-7. However, as the statute does require urban retail water suppliers to comply, the WFA supports IEUA’s position of preparing a regional approach establishing a baseline and setting targets based on regional demands and in support of IEUA’s eight retail member agencies that must comply.

IEUA and all of its member agencies are signatories to the Memorandum of Understanding regarding Urban Water Conservation in California and are members of the California Urban Water Conservation Council. As one of the original signatories to the MOU in 1991, IEUA’s highest conservation priority has been to ensure that good-faith efforts are made on behalf of the member agencies in implementing Best Management Practices, locally.

Over the last nineteen years, IEUA has been committed to developing and implementing many core regional conservation programs that have been designed on the foundation of BMPs, and these programs continue to serve as a key component in the overall regional water resource management portfolio for the region. (see Chapter 4 for more details.)