
*Crestline-Lake Arrowhead
Water Agency*



*2005
Urban Water Management Plan*

May 2006

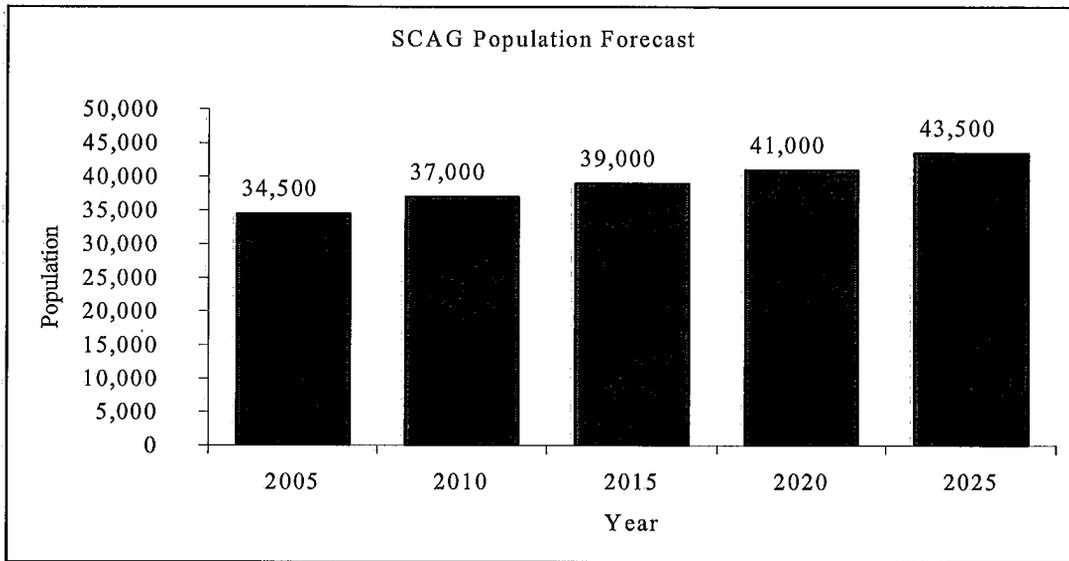
area is primarily single family residential, and this pattern is expected to continue. This data is compiled in Table 2, Water Purveyors, Service Connections, and Water Use in CLAWA Area.

The Agency, in its role as a water retailer, currently maintains approximately 1,179 retail service connections and serves a population of approximately 2,750 permanent residents. The seasonal population of CLAWA's retail customers can increase to approximately 5,500.

**TABLE 2
SERVICE CONNECTIONS, POPULATION AND WATER USE IN CLAWA
SERVICE AREA**

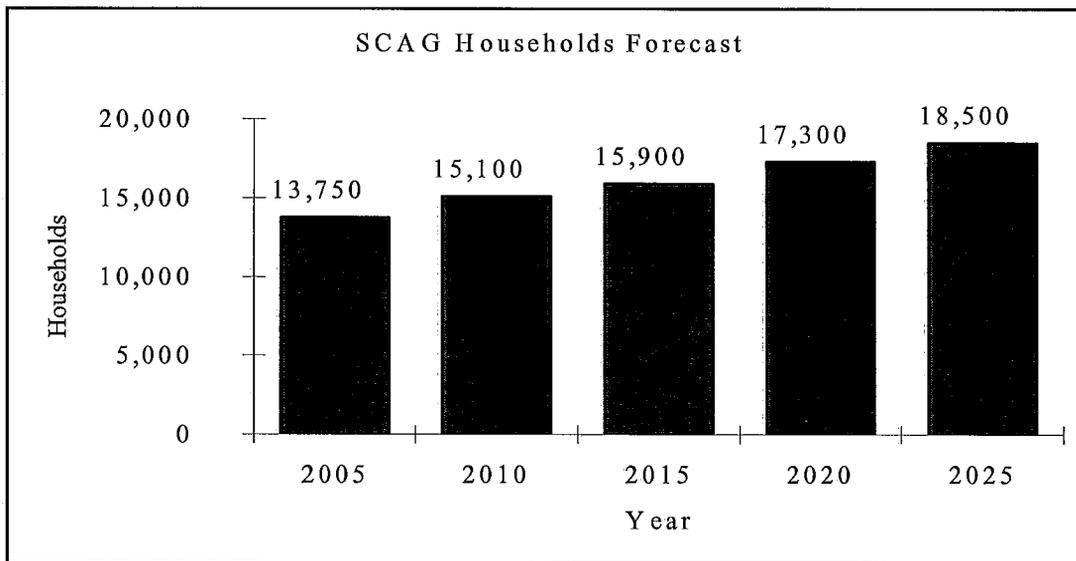
Estimates Made by CLAWA and its Purveyors
<ul style="list-style-type: none"> • There are approximately 14,750 active service connections in entirety of CLAWA's service area. Of this total, the majority (approximately 13,571 or 92 percent) are served by CLAWA's purveyor customers. The remaining 1,179 connections are served directly by CLAWA.
<ul style="list-style-type: none"> • Ninety-three percent (1,097) of the retail service connections in the CLAWA service area are classified as general or residential. There are about 57 commercial connections, 8 agricultural/irrigation connections, no industrial connections, and 17 other water systems and camps.
<ul style="list-style-type: none"> • The CLAWA service area has an estimated permanent population of approximately 34,500. However, there are strong seasonal factors which can approximately double the peak population to an estimated 69,000.
<ul style="list-style-type: none"> • In addition to the water annually imported by CLAWA, water purveyors in the CLAWA service area produce approximately 1200-1600 ac-ft annually from local water sources.

FIGURE 2
CLAWA SERVICE AREA POPULATION FORECAST



Revised 12/7/05
Source: SCAG 2005; Albert A. Webb Associates.

FIGURE 3
HOUSEHOLD FORECAST UNINCORPORATED PORTION OF CENSUS TRACTS



Revised (12/7/2005)
Source: SCAG 2005; Albert A. Webb Associates.

this. First, the California Regional Water Quality Control Board, Lahontan Region, has had a longstanding prohibition against the use of recycled water at elevations above 3,200 feet in the San Bernardino Mountains. In January 2003, a request for a Basin Plan amendment was filed. The amendment would allow the discharge of treated waters that are of waste origin above 3,200-foot elevation. In early September 2003, the Regional Board recommended approval of the Basin Plan Amendment. The amendment was reviewed and approved by the State Water Resources Control Board and the US Environmental Protection Agency in 2004. These changes will allow recycled water projects to proceed.

Second, because of the climate, topography, and development patterns in the mountains, there are very few sizable landscaped areas where recycled water could potentially be used for irrigation. Third, for the same reasons, total landscaped area is extremely low, since most lots have little landscaped area. Fourth, there are no industrial uses to speak of in the CLAWA service area, hence no potential market for industrial use of reclaimed water. Most commercial uses are also fairly small. Fifth, the lack of potential major users of recycled water makes the economic feasibility of constructing dual water systems not viable at this point in time.

For purposes of this plan, it has been assumed that all reclaimed water supply and use will be handled by others due to the fact that CLAWA does not have any wastewater treatment facilities or a reclaimed water distribution system.

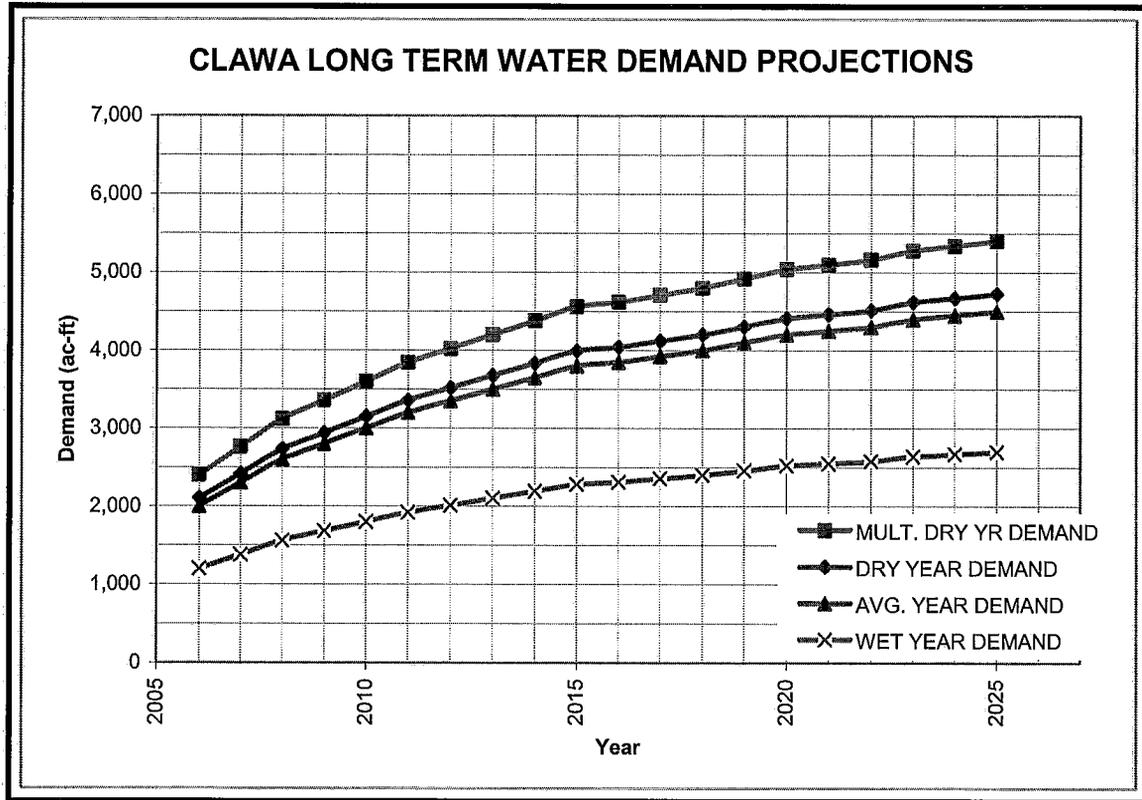
Table 4 Current and Projected Water Supplies					
Water Supply Sources	2005	2010	2015	2020	2025
Available from DWR ^{1,2}	3,800	4,060	4,060	4,060	4,060
Locally produced groundwater	0	0	0	0	0
Locally Surface Water ³	433	433	433	433	433
Transfers					
Exchanges In					
Recycled Water	0	0	0	0	0
Other					
Total	4,233	4,493	4,493	4,493	4,493
Units of Measure: Ac-ft/Year					
¹ 2005 availability based upon approved DWR Table A allocation percentage of 65%					
² Future availability based upon SWP long term reliability of 70%					
³ Average total surface water available from Houston Creek via Lake Silverwood from 1989-2004					

Table 4A
Historical Water Supplies (SWP and Houston Creek)

Calendar Year	State Water Project Deliveries (ac-ft)			Water Year ¹	Houston Creek Water (ac-ft)
1990	---			89-90	123
1991	---			90-91	472
1992	---			91-92	692
1993	---			92-93	617
1994	---			93-94	391
1995	409			94-95	492
1996	485			95-96	603
1997	651			96-97	608
1998	187			97-98	517
1999	1,132			98-99	13
2000	1,194			99-00	264
2001	1,057			00-01	671
2002	2,189			01-02	0
2003	1,563			02-03	471
2004	2,006			03-04	557
				Average	433

¹ The 12-month period from October through September. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. For example, the year ending September 30, 1992 is called the "1992 water year".

FIGURE 4
CLAWA's PROJECTED WATER DEMAND



Source: Albert A. Webb Associates (05-0535/UWMP/demand projection_rev.xls)

The Agency's experience from the late 1978 to 2005 provides data to evaluate the reliability of the Agency's water supply for an average water year, a single dry water year, and multiple dry water years. Figure 5 shows the approved SWP allocations each year between 1978 and 2005. The average approved allocation for these years is approximately 87%. DWR has recently published a 2005 Draft Reliability report for the SWP (copy included as Appendix D). The probable long-term water deliveries from the SWP are given as a function of the percentage of water being delivered. For example, DWR states that approximately 70% of the time the SWP will have a 70% approved allocation and approximately 82% of the time the SWP will have a 50% approved allocation. For the purposes of this report, a 100% allocation will be used as a wet year supply, a 70% allocation will be used as an average year supply, a 34% allocation will be used for a single dry year supply, and an approximately 40% allocation will be used for multiple dry year supply (see Appendix D Table B-2 page 51). Figure 6 shows the projected water supply available for each of these allocation scenarios.

Table 5
Water Supply Reliability

	Average Water Year (70% SWP & Avg HC)		Single Dry Water Year (34% SWP & 0% HC)		Multiple Dry Water Year (40% SWP & 20% HC)	
Source		Supply (ac-ft)		Supply (ac-ft)		Supply (ac-ft)
SWP	70% Allocation	4,060	34% Allocation	1,950**	40% per DWR Reliability Report	2,320
Houston Creek	Average Houston Creek	433*	0% of Houston Creek	0	20% of Houston Creek	173
Total Supply		4,493		1,950		2,493

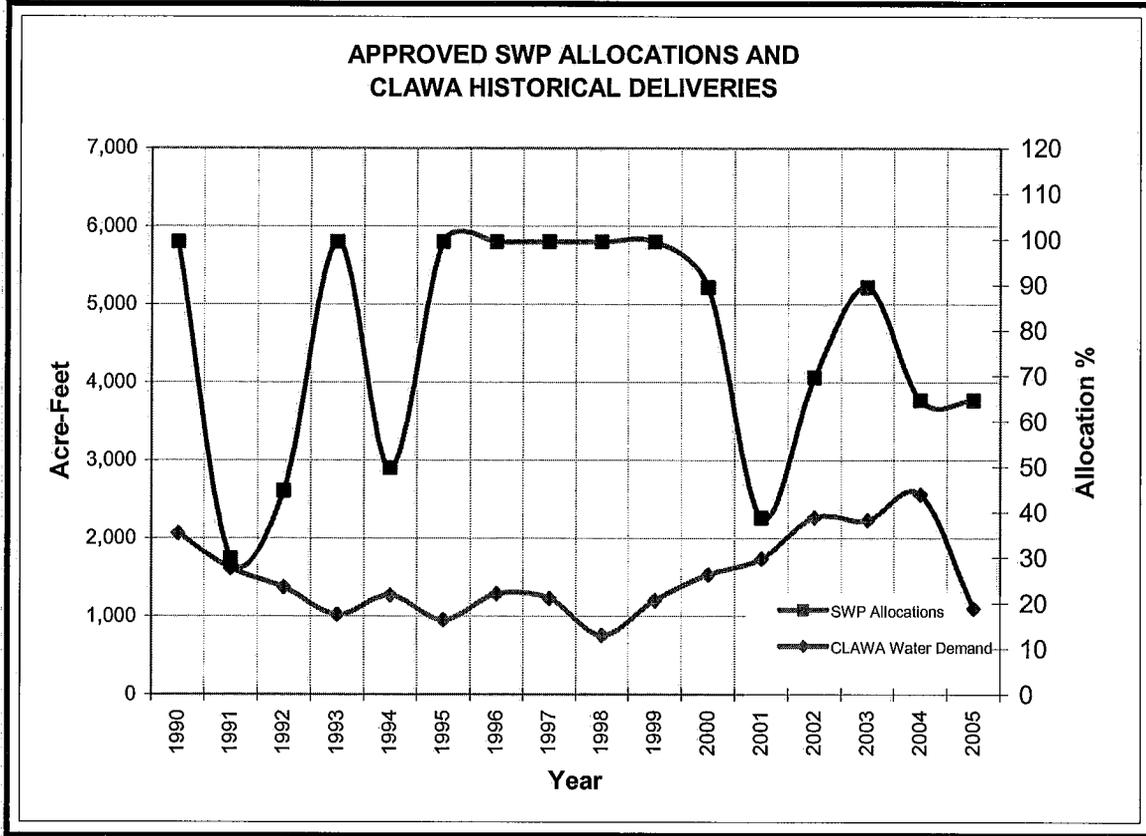
* Average Houston Creek appropriations from 1990-2004 have been 433 ac-ft/yr.

** Department of Water Resources granted CLAWA 1,950 ac-ft per year as a Minimum allocation of SWP deliveries for domestic, health/safety, and fire fighting uses.

Frequency and Magnitude of Supply Deficiencies

Figure 8 shows the historical allocations from the SWP and the total water deliveries made by CLAWA (total deliveries include water supplied by the SWP and Houston Creek). As can be seen in Figure 8 and in the SWP Reliability Report, the SWP is a very reliable source of water supply. There are annual supply availability fluctuations but on the whole, the SWP has been able to deliver an average allocation of 78% over the past 15 years. Figure 8 also shows that the SWP approved allocations have greater than 1,000 ac-ft above the total CLAWA demand in all but three of the last fifteen years. Going forward, the SWP is anticipated to deliver approximately 80% allocations in 50% of the years. It is also anticipated that allocations less than 40% will be limited to approximately one in every six and a half years (see Appendix D page 24 & 25). The DWR has done a better job since 1991 at managing the SWP and minimizing low allocation years. The DWR has also been successful at creating a more dependable water supply.

Figure 8
SWP Approved Allocations and CLAWA's Historical Demand



Source: Albert A. Webb Associates (05-0535/UWMP/demand projection_rev.xls)

Plans to Assure a Reliable Water Supply

The Department of Water Resources requires all state water contractors (SWC) to submit a tentative long-term water delivery schedule for anticipated SWP water deliveries. This long-term water delivery schedule projects water deliveries over a 33-year period and includes anticipated allocations from Houston Creek. Table 6, Projected Water Demand throughout CLAWA's Service Area, utilizes this tentative long-term water delivery schedule in projecting future water demands from these sources. Also included in Table 6, are local water sources other than Houston Creek. These local water sources within CLAWA's service area were estimated to have a safe yield of 1,620 ac-ft of water per year (CLAWA 1963). Although CLAWA does not currently use any local water source other than Houston Creek, other water purveyors within CLAWA's service area do. Since water from these sources is used in supplying the population within CLAWA's service territory and estimated future water demand is derived from the future population estimates, these other local water sources need to be included in the analysis.

Table 6
Projected Water Demand throughout CLAWA's Service Area

Sources	Year				
	2005	2010	2015	2020	2025
Projected CLAWA Deliveries (ac-ft/year) ⁶	1,100 ¹	3,000	3,800	4,200	4,500
Projected Deliveries from Other Local Water Sources (ac-ft/year) ²	2,000 ⁴	1,600 ⁵	1,600 ⁵	1,600 ⁵	1,600 ⁵
Total Water Demand Projections for Entire Service Area (ac-ft/year) ³	3,100	4,600	5,400	5,800	6,100

¹ Historical Data (lower than average demand year)

² Estimated from total water supply once SWP deliveries were subtracted

³ Estimated using service area population (population x 125 gal/person-day)

⁴ Local production increase due to higher than normal local precipitation

⁵ Long term average for local water production (CLAWA 1963)

⁶ See Figure 4 Average Demand curve

Reliability Comparison

Table 7 details estimated water supply projections associated with several water supply reliability scenarios. For further information on the data, see Three-year Minimum Supply and Water Shortage Contingency Plan sections.

Table 7 Historical SWP Supply Reliability				
Average/ Normal Water Year 2002 (Volume)	Single Dry Water Year 1991 (Volume)	Multiple Dry Water Years ¹		
		Year 1 1991 (Volume)	Year 2 1992 (Volume)	Year 3 1993 (Volume)
4,060 (70%)	1,950 (34%)	1,950 (34%)	2,610 (45%)	5,800 (100%)
Unit of Measure: Ac-ft/Year				
¹ Actual three driest years on record for CLAWA				

TABLE 8
CLAWA's 2003 Water Deliveries by Customer Category

CUSTOMERS	CLAWA's 2003 WATER DELIVERIES	
	Water Deliveries (ac-ft)	Percent of Water Deliveries (%)
Improvement District "A"	10	0.5
Improvement District "B"	173	8.4
Improvement District "C"	29	1.4
Improvement District "D"	135	6.5
Wholesale Customers	1,617	78.1
Other Retail Customers	107	5.1
Total Water Use	2,071	100

Source: Albert A. Webb Associates (2003 Annual Report to CDHS)

Water Purveyor Data

As described previously, CLAWA is primarily a water wholesaler. That is, the Agency contracts for State Water Project water, and in turn sells this water to public and private retail water purveyors in CLAWA's service area. It has always been the policy of CLAWA not to compete with other water purveyors for retail water service within the Agency. There are four improvement districts in which CLAWA acts as a water retailer directly to 1,179 customers. The Agency delivered approximately 2,071 ac-ft of water in 2003 (approximately 1,617 ac-ft), 78 percent of which was wholesale water and 22 percent was retail water.

CLAWA does not have any information regarding the retail customers of its wholesale customers. Additional information regarding those water purveyors could be found by consulting each individual purveyor or by consulting the California Department of Health Services and County of San Bernardino Department of Environmental Health Services records.