

Appendix A

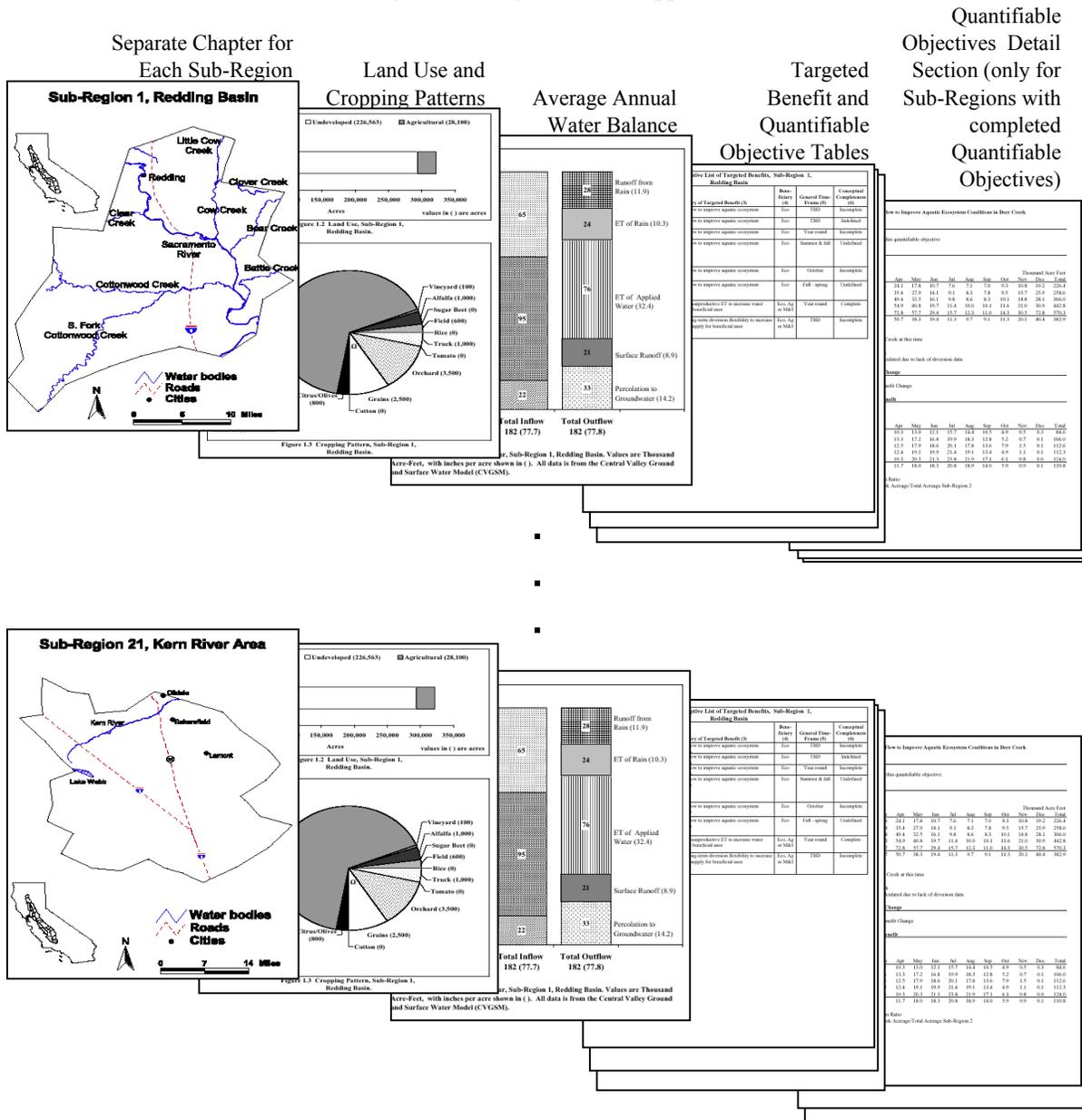
Complete List of Quantifiable Objectives by Sub-Region

Appendix A contains a list of the completed and the potential Quantifiable Objectives (QOs). To-date, 196 potential QOs have been identified. Of these, approximately 50 have been completed. WUE proposals that incorporate completed QOs will be given extra weight in the selection process.

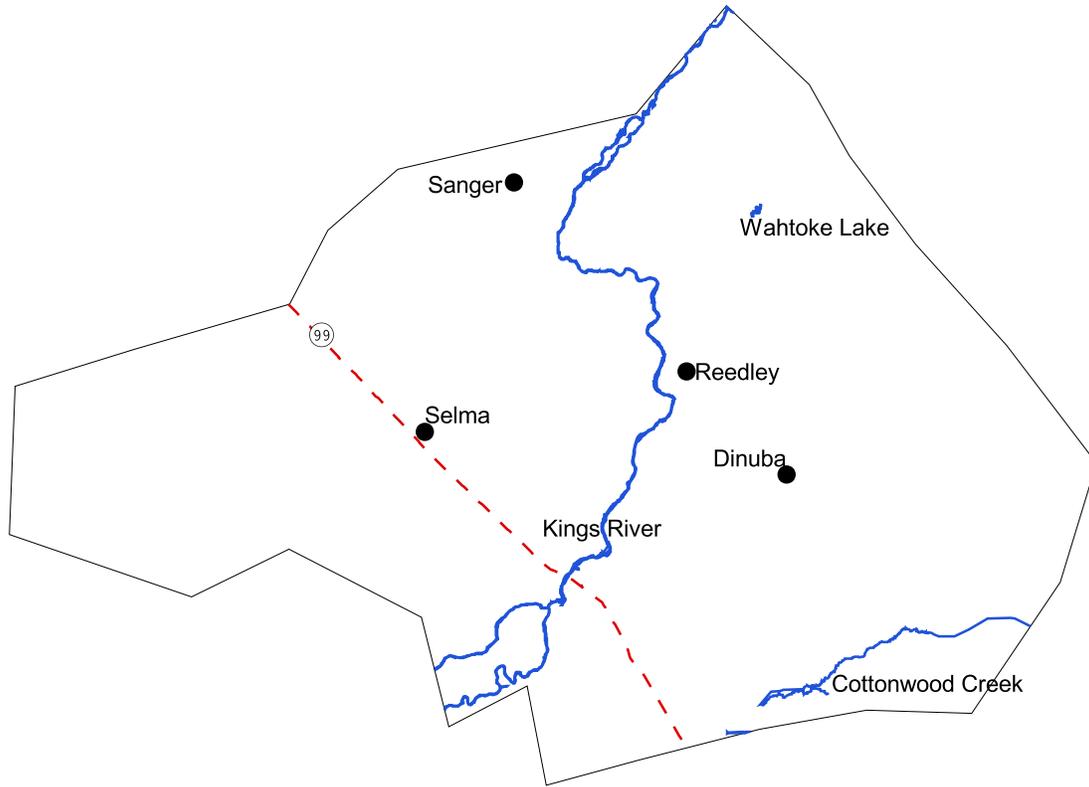
Readily available data does not exist to allow completion of the remaining QOs. However, approximately 45 of the uncompleted QOs have been identified as high priority, and proposals that are linked to these priority outcomes (or Targeted Benefits) will also receive extra weight in the selections (although not as much weight as those that incorporate completed QOs).

Appendix A is organized into 21 chapters that correspond to the 21 Sub-Regions defined in the QO analysis. Each chapter contains background information and details as illustrated in Figure A.I.

Figure A.I. Organization of Appendix A



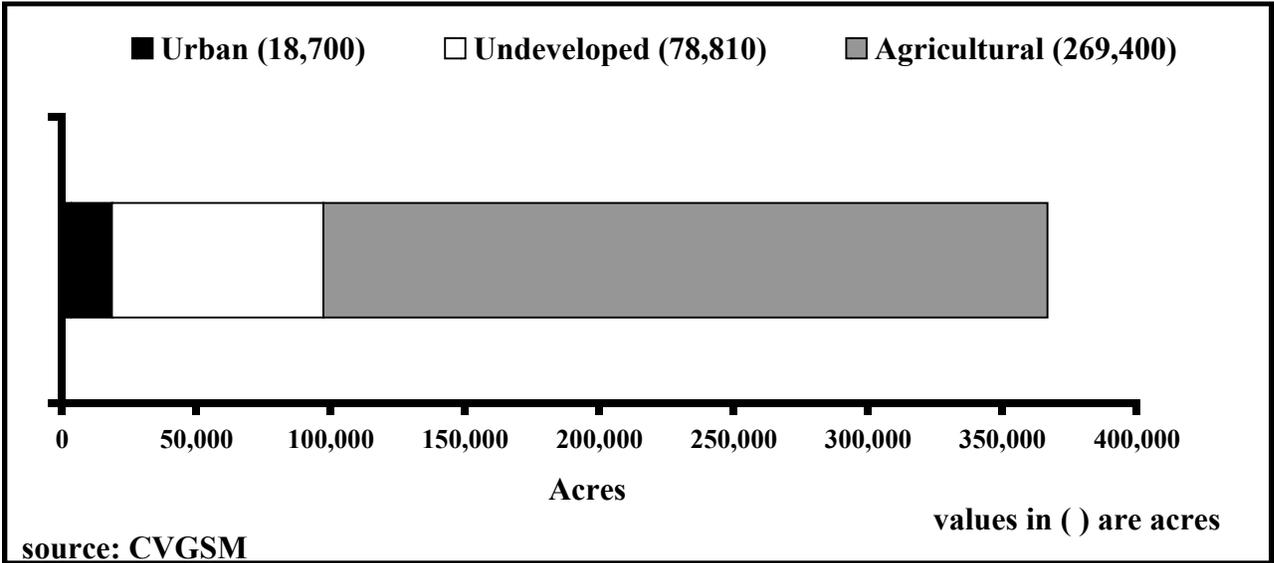
Sub-Region 17, Kings River Area



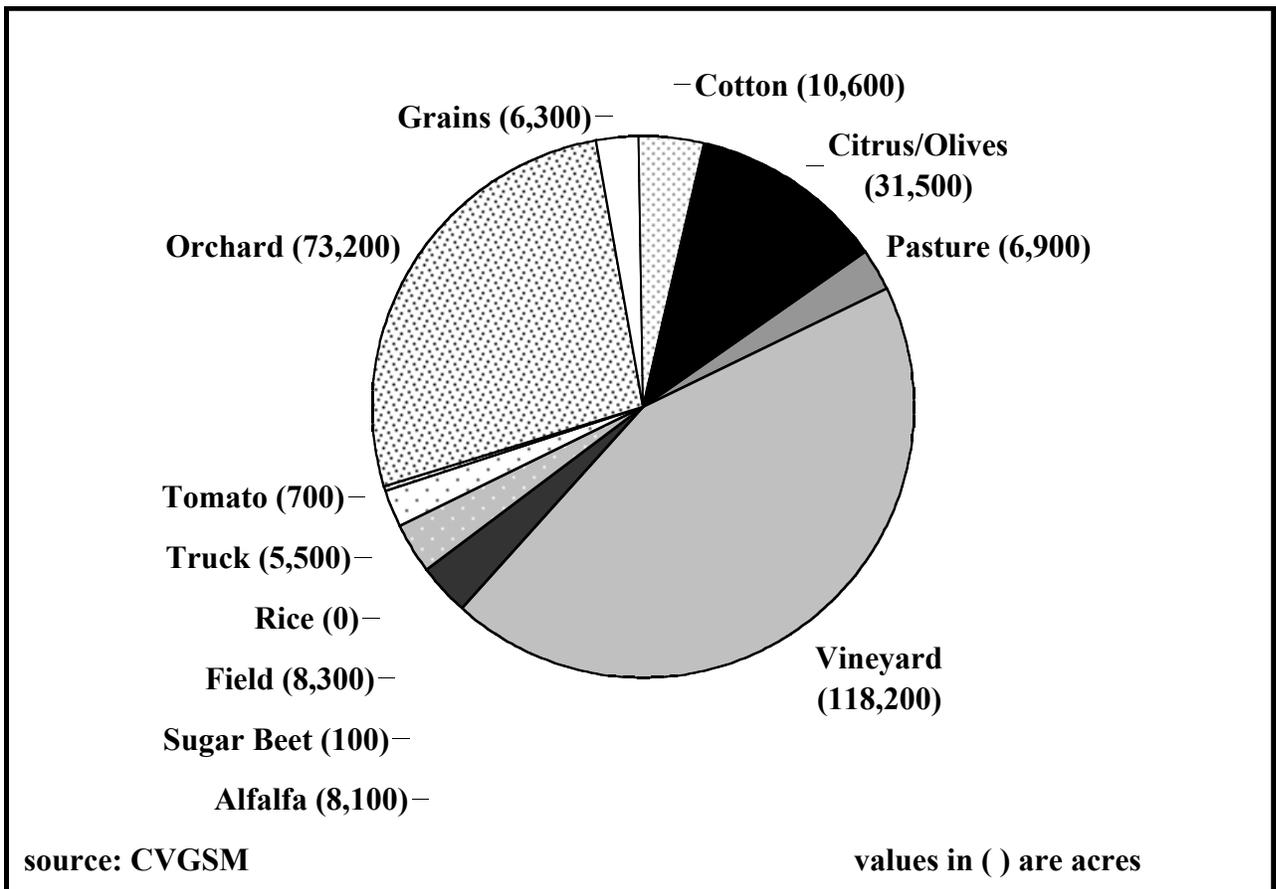
 **Water bodies**
Roads
Cities



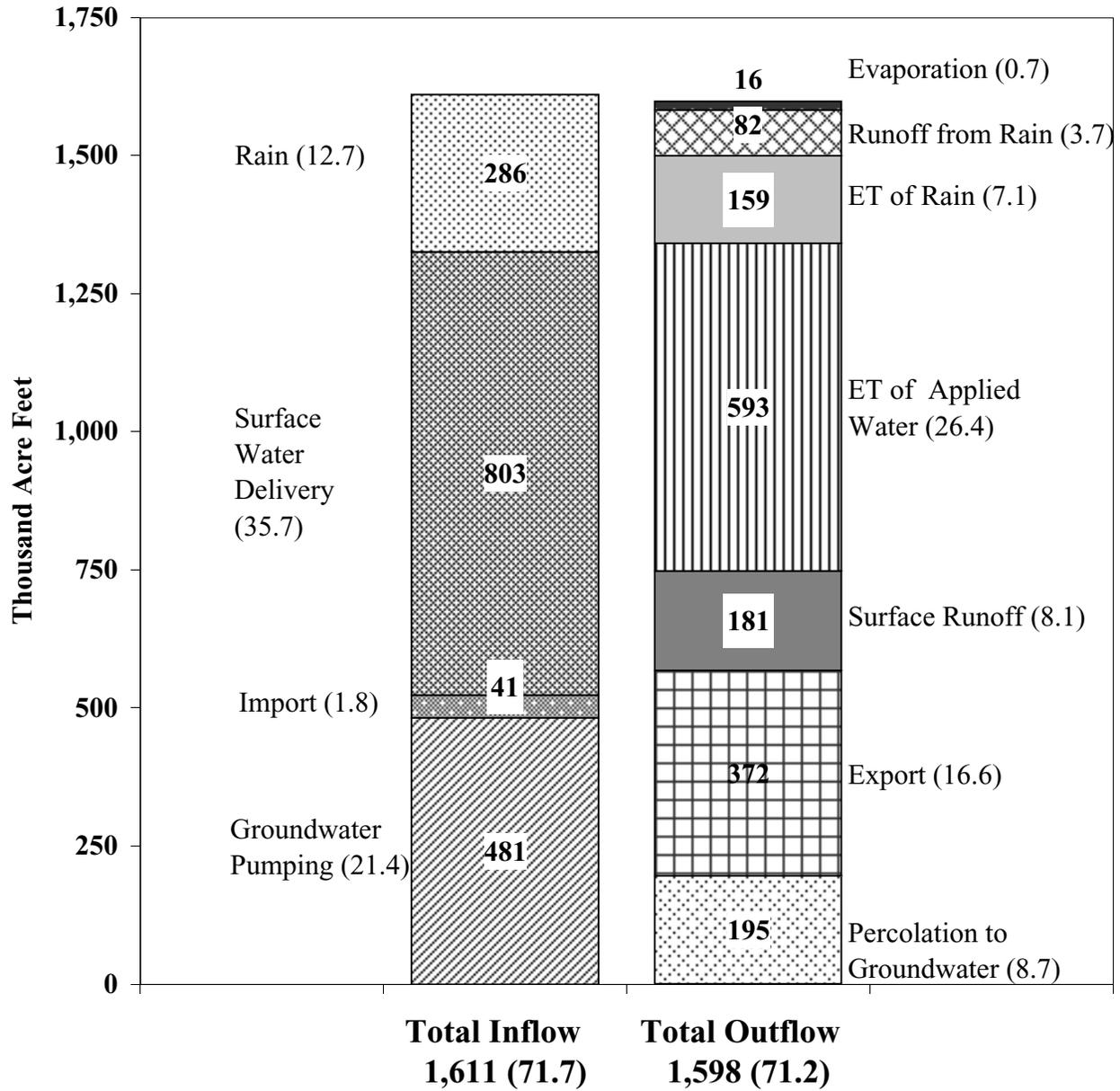
**Figure A.17.2 Land Use, Sub-Region 17,
Kings River Area.**



**Figure A.17.3 Cropping Pattern, Sub-Region 17,
Kings River Area.**



Sub-Region 17 Water Balance



Farm Water Balance, Average Year, Sub-Region 17, Kings River Area. Values are Thousand Acre-Feet, with inches per acre shown in (). All data is from the Central Valley Ground and Surface Water Model (CVGSM).

**Table A.17.1. Descriptive List of Targeted Benefits, Sub-Region 17,
Kings River Area**

TB # (1) [duplicate]	Location (2)	Category of Targeted Benefit (3)	Bene- ficiary (4)	General Time- Frame (5)	Conceptual Completeness (6)
179	All affected lands	Quantity: Decrease flows to salt sinks to increase the water supply for beneficial uses	Eco, Ag or M&I	Irrigation season	Incomplete
180	All affected lands	Quantity: Decrease nonproductive ET to increase water supply for beneficial uses	Eco, Ag or M&I	Year round	Complete
181	All suitable lands	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Eco, Ag or M&I	TBD	Incomplete
182	Salt affected soils	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Ag	Irrigation season	Complete

**Table A.17.2. Quantified Targeted Benefits, Sub-Region 17,
Kings River Area**

TB # (1) [duplicate]	Source and Description of Quantified Targeted Benefit (7)
179	Core: Reduce existing flows to salt sinks by _____ acre-feet per year.
180	Core: Reduce unwanted ET by _____ acre-feet per year.
181	Core: Enhance the effectiveness of potential conjunctive use programs by reducing flows to groundwater to _____ acre feet per year during periods of shortage; and increasing flows to groundwater to _____ acre feet per year during periods of excess.
182	Core: While remaining within the salinity threshold for a given crop, take advantage of periodic opportunities to reduce salinity impacts by increasing leaching by _____ during periods of excess supply and by reducing by _____ leaching during water short periods.

**Table A.17.3. Quantified Targeted Benefit Change, Sub-Region 17,
Kings River Area**

TB # (1) [duplicate]	Reference Condition		Quantified Targeted Benefit		Quantified Targeted Benefit Change			Specific Time-Frame (11)
	Data Source (8)	Availability (9)	Data Source (8)	Data Availability (9)	Data Source (8)	Availability (9)	Range of Values (10)	
179	CVGSM/Core	Rough estimate	Core	Rough estimate	Calculated	Rough estimate	TBD	Irrigation season
180	CVGSM	Unproven-precise	Core	Rough estimate	Calculated	Rough estimate	14.2 TAF/yr	TBD
181	CVGSM	Unproven-precise	Core	Rough estimate	Calculated	Rough estimate	TBD	TBD
182	Core	Rough estimate	Core	Rough estimate	Calculated	Rough estimate	TBD	Irrigation season

**Table A.17.4. Quantifiable Objective, Sub-Region 17,
Kings River Area**

TB # (1) [duplicate]	Achievable Agricultural Potential (12)	Quantifiable Objective (13)
179	TBD	TBD
180	14.2 TAF per year plus additional water generated through reduction in application through improved irrigation systems	14.2 TAF per year plus additional water generated through reduction in application through improved irrigation systems
181	TBD	TBD
182	TBD	TBD

**Table A.17.5. Affected Flow Paths and Possible Actions, Sub-Region 17,
Kings River Area**

TB # (1) [duplicate]	Affected Flow Paths (14)	Possible Actions (provided as examples; proposers are encouraged to consider local actions that are not listed) (15)
179	TBD	TBD
180	ETAW	Reduce ET flows using improved irrigation methods, such as drip irrigation, and planting densities.
181	TBD	TBD
182	TBD	TBD

Detail 180, Decrease Nonproductive ET, SubRegion 17

Step 1. Quantified Targets

A. Acreage Assumed for Reduction of Nonproductive ET

source: CVGSM Sub-Region 17

Crop	Potential for ET Red.	Existing		Assumed for ET Reduction*	
		acres	percent	acres	percent
Pasture	No	6,900	0%	0	0%
Alfalfa	No	8,100	0%	0	0%
Sugar Beet	No	100	0%	0	0%
Field	No	8,300	0%	0	0%
Rice	No	0	0%	0	0%
Truck	Yes	5,500	30%	1,650	30%
Tomato	Yes	700	30%	210	30%
Orchard	Yes	73,200	30%	21,960	30%
Grains	No	6,300	0%	0	0%
Vineyard	Yes	118,200	30%	35,460	30%
Cotton	No	10,600	0%	0	0%
Citrus and Olives	Yes	31,500	30%	9,450	30%
Total		269,400	26%	68,730	26%

*The Assumed Acreage for ET Reduction is 30% of the crops that have the Potential for ET Reduction.

B. Existing ET for Sub-Region 17

source: CVGSM

Crop	Inches												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Pasture	---	---	---	---	---	---	---	---	---	---	---	---	---
Alfalfa	---	---	---	---	---	---	---	---	---	---	---	---	---
Sugar Beet	---	---	---	---	---	---	---	---	---	---	---	---	---
Field	---	---	---	---	---	---	---	---	---	---	---	---	---
Rice	---	---	---	---	---	---	---	---	---	---	---	---	---
Truck	0.00	0.00	0.00	2.60	2.90	3.30	3.40	1.80	1.30	1.20	0.00	0.00	16.50
Tomato	0.00	0.00	0.00	3.60	6.70	7.60	5.40	1.60	1.00	0.00	0.00	0.00	25.90
Orchard	0.90	1.30	1.70	2.90	4.90	6.00	6.70	5.70	3.50	2.10	1.00	0.70	37.40
Grains	---	---	---	---	---	---	---	---	---	---	---	---	---
Vineyard	0.00	0.00	0.00	1.00	3.70	5.80	6.60	5.50	3.50	1.30	0.00	0.00	27.40
Cotton	---	---	---	---	---	---	---	---	---	---	---	---	---
Citrus and Olives	0.00	0.00	1.90	2.70	4.20	4.80	5.00	4.20	2.80	2.00	0.00	0.00	27.60
Total	0.29	0.42	0.80	1.89	4.14	5.67	6.33	5.28	3.34	1.65	0.32	0.22	30.36

C. ET from Rain for Sub-Region 17

source: CVGSM

	Inches												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1) Critical	0.61	0.72	0.73	0.78	0.54	0.26	0.19	0.25	0.61	0.91	0.61	0.36	6.56
2) Dry	0.64	0.81	1.23	0.69	0.35	0.18	0.21	0.19	0.51	0.87	0.60	0.41	6.69
3) B Norm	0.70	0.84	1.14	1.09	0.51	0.12	0.19	0.15	0.46	1.04	0.62	0.43	7.27
4) A Norm	0.74	0.81	1.33	1.13	0.08	0.09	0.17	0.17	0.55	0.92	0.59	0.47	7.05
5) Wet	0.80	0.82	1.40	1.52	0.38	0.14	0.15	0.15	0.65	1.10	0.63	0.48	8.22
Wtd Avg.	0.69	0.79	1.13	1.00	0.37	0.16	0.19	0.19	0.56	0.96	0.61	0.42	7.07

D. Existing ETAW for Sub-Region 17

source: calculated = Step 1B.(Average Total) - Step 1C., (set to 0 if Step 1B. - Step 1C. <0)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.00	0.00	0.08	1.11	3.60	5.41	6.14	5.03	2.74	0.73	0.00	0.00	24.84
2) Dry	0.00	0.00	0.00	1.19	3.79	5.49	6.12	5.10	2.83	0.77	0.00	0.00	25.31
3) B Norm	0.00	0.00	0.00	0.80	3.63	5.55	6.14	5.14	2.88	0.61	0.00	0.00	24.75
4) A Norm	0.00	0.00	0.00	0.76	4.06	5.59	6.16	5.11	2.79	0.73	0.00	0.00	25.19
5) Wet	0.00	0.00	0.00	0.37	3.76	5.54	6.18	5.13	2.70	0.55	0.00	0.00	24.21
Wtd Avg.	0.00	0.00	0.02	0.88	3.77	5.51	6.15	5.10	2.78	0.69	0.00	0.00	24.90

E. Target ETAW for Sub-Region 17

source: calculated = Step 1D. * 90%

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.00	0.00	0.07	1.00	3.24	4.87	5.52	4.53	2.46	0.66	0.00	0.00	22.35
2) Dry	0.00	0.00	0.00	1.07	3.41	4.94	5.51	4.59	2.55	0.70	0.00	0.00	22.78
3) B Norm	0.00	0.00	0.00	0.72	3.27	5.00	5.53	4.63	2.59	0.55	0.00	0.00	22.28
4) A Norm	0.00	0.00	0.00	0.68	3.66	5.03	5.54	4.60	2.51	0.65	0.00	0.00	22.67
5) Wet	0.00	0.00	0.00	0.33	3.38	4.98	5.56	4.62	2.43	0.49	0.00	0.00	21.79
Wtd Avg.	0.00	0.00	0.02	0.79	3.39	4.96	5.53	4.59	2.51	0.62	0.00	0.00	22.41

Step 2. Reference Condition

For ET Reduction the Reference Condition is the existing Crop ET, Step 1B.

Step 3. Quantified Targeted Benefit Change

A. Quantified Targeted Benefit Change for Sub-Region 17

source: calculated = Step 1D - Step 1E

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	---	0.11	0.36	0.54	0.61	0.50	0.27	0.07	---	---	2.48
2) Dry	---	---	---	0.12	0.38	0.55	0.61	0.51	0.28	0.08	---	---	2.53
3) B Norm	---	---	---	0.08	0.36	0.56	0.61	0.51	0.29	0.06	---	---	2.48
4) A Norm	---	---	---	0.08	0.41	0.56	0.62	0.51	0.28	0.07	---	---	2.52
5) Wet	---	---	---	0.04	0.38	0.55	0.62	0.51	0.27	0.05	---	---	2.42
Wtd Avg.	---	---	---	0.09	0.38	0.55	0.61	0.51	0.28	0.07	---	---	2.49

B. Quantified Targeted Benefit Change for Sub-Region 17

source: calculated = Step 1D - Step 1E

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	---	0.64	2.06	3.10	3.51	2.88	1.57	0.42	---	---	14.2
2) Dry	---	---	---	0.68	2.17	3.15	3.51	2.92	1.62	0.44	---	---	14.5
3) B Norm	---	---	---	0.46	2.08	3.18	3.52	2.94	1.65	0.35	---	---	14.2
4) A Norm	---	---	---	0.44	2.33	3.20	3.53	2.93	1.60	0.42	---	---	14.4
5) Wet	---	---	---	0.21	2.15	3.17	3.54	2.94	1.55	0.31	---	---	13.9
Wtd Avg.	---	---	---	0.51	2.16	3.15	3.52	2.92	1.59	0.40	---	---	14.2

Step 4. Area Affected by Targeted Benefit

Area affected are the 68,730 acres identified in Step 1A.

Step 5. Water Flow Path Elements

The flow path elements used in this analysis are given in Step 1.

Step 6. Idealized Agricultural Potential

Additional ET research is required to determine this component.

Step 7. Achievable Agricultural Potential

The farm Available Agricultural Potential is the same as Step 3B.

Step 8. Quantifiable Objective

A. For ET Reduction the Quantifiable Objective is Step 3B