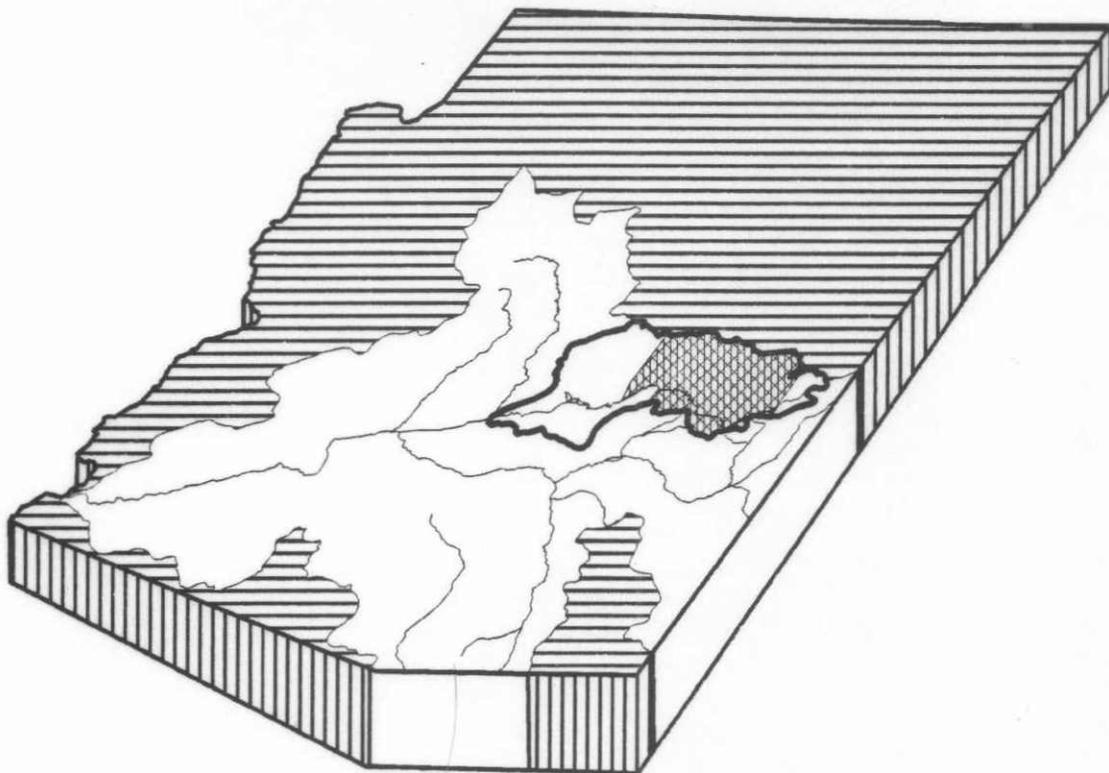


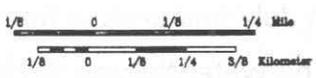
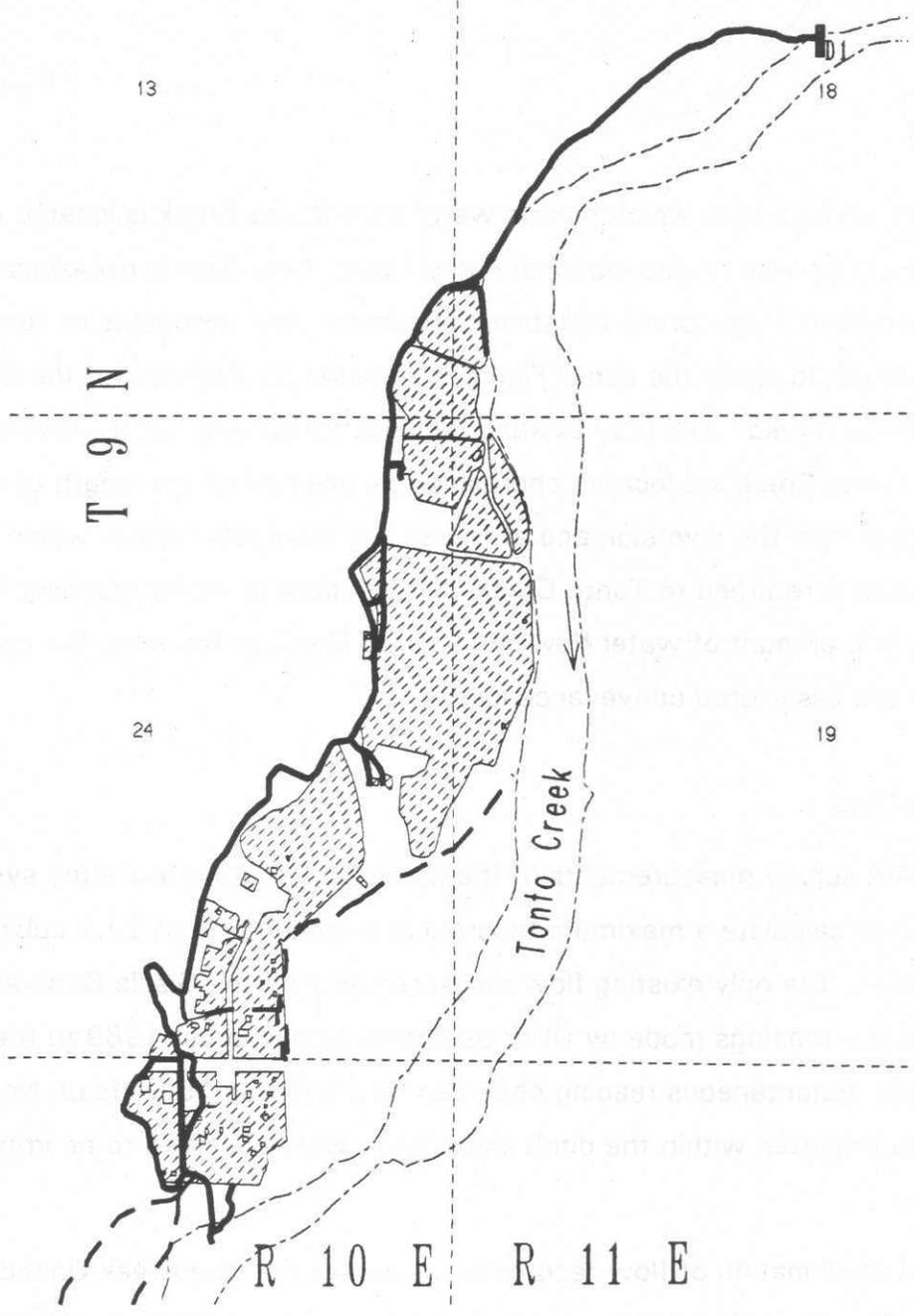
PRELIMINARY
HYDROGRAPHIC SURVEY REPORT FOR
THE UPPER SALT RIVER WATERSHED

Volume 1: General Assessment

In Re The General Adjudication of the
Gila River System and Source



Arizona Department of Water Resources
Submitted for Review and Comment
December 1992



-  Lands Served by the Gisela Community Ditch Association
-  Section Line
-  Gisela Community Ditch
-  Curry Ditch (Abandoned)
-  River or Wash



Figure 5-2. Lands served by the Gisela Community Ditch.

Facilities

The earthen dam which diverts water from Tonto Creek is located on United States Forest Service (Tonto National Forest) land. This dam is occasionally destroyed by flood flows in Tonto Creek and diversions cease until flow rates in Tonto Creek decline enough to repair the dam. Figure 5-2 shows an overview of the Gisela ditch and the lands served. The only existing facilities for turning out the diverted excess water to Tonto Creek are located approximately one-half of the length of the ditch downstream from the diversion and at the end of the ditch. Water which is diverted and not used is returned to Tonto Creek. The amount of water reaching irrigators is limited by the amount of water flowing in Tonto Creek at the time, the capacity of the ditch and the associated conveyance losses.

Diversion Data

DWR survey measurements of the diversion structure and ditch system have been used to calculate a maximum theoretical diversion rate of 23.1 cubic feet per second (cfs). The only existing flow measurements on the Gisela Ditch are instantaneous readings made by DWR personnel from August 1989 to the present. The highest instantaneous reading observed by DWR was 15.0 cfs on November 27, 1990. No irrigators within the ditch association were observed to be irrigating fields at that time.

An examination of flow records measured at the Gun Creek United States Geological Survey gaging station, located about seventeen miles downstream from Gisela, reveals that Tonto Creek is seldom completely dry. Flow rates in Tonto Creek diminish to around three cfs in July and peak in March due to spring snow melt. The only time that DWR observed no water flowing in the Gisela ditch was during the month of April after high spring flow rates had destroyed the diversion dam.

Based on DWR's instantaneous flow measurements, the GCDA diverts an estimated 5,010 acre-feet of water per year, or about thirty-five acre-feet of water per acre of land. The highest water duty assigned to any irrigation potential water right served by the Gisela Community ditch is 9.2 acre-feet per acre while the average gross irrigation requirement for actively irrigated lands served by the Gisela ditch is only 83.4 inches or just under seven acre-feet per acre. The amount of water diverted and



Figure 5-3. Diversion from Tonto Creek into the Gisela Community Ditch (left). The semi-permanent nature of this diversion coupled with no existing control valve at the head of the ditch causes water to be diverted even when not in use.



Figure 5-4. This pecan orchard with ground cover is irrigated with a border flood irrigation system, a method typical on lands which receive water from the Gisela Community Ditch.

available for use from the Gisela ditch would provide 1,405.4 inches of water or 117.2 acre-feet per acre to those lands seen to be actively irrigated during the crop survey. DWR computes the maximum demand on the ditch to about 3.4 cfs during the month of June. This agrees with the diversion rate of 3.2 cfs measured by DWR during the months of June and July (Table 5-5). It is apparent that much more water than necessary to meet crop demands and system and conveyance losses is diverted. Much of this water is diverted only because the GCDA diversion system does not allow for the water to be turned back into Tonto Creek until it has been transported down a long length of the ditch.

Quantification of Irrigation Uses

The irrigation uses served by the Gisela Community Ditch can be broadly categorized by two type of users: those who irrigate pasture for the purpose of rearing livestock and those who irrigate small gardens, lawns, and orchards around houses. As a result, the major crops that are served by the ditch include pasture, fruit and pecan trees, and lawns and gardens. Irrigation methods are predominantly made up of border or wildflood irrigation systems. The slopes in the area are relatively steep, causing some systems to be inefficient. Tailwater from some of these fields is utilized by other irrigators. Privately owned wells can supplement 10.4 acres of lawns and gardens during dry months and when the ditch is being repaired. The contribution of water pumped from these wells is assumed to be negligible due to the abundant supply of water which is typically available for use within this system. Table 5-6 displays an analysis of the amount of surface water diverted verses the amount used by irrigators served by the GCDA. The lands served by the Gisela Community Ditch divided up according to potential water rights are presented in Table 5-7.

TABLE C-9

UPPER SALT RIVER WATERSHED
 WEIGHTED AVERAGE CROP CONSUMPTIVE USE, EFFECTIVE PRECIPITATION
 AND NET IRRIGATION REQUIREMENTS (IN FEET OF WATER)

ELEVATION SECTORS 1 AND 2

<u>CROP</u>	<u>ET</u>	<u>EP</u>	<u>PEP</u>	<u>NIR</u>
Alfalfa	5.05	0.67	0.26	4.12
Corn	1.70	0.46	0.25	0.99
Orchard	3.37	0.56	0.30	2.51
Orchard with ground cover	4.56	0.63	0.33	3.60
Pasture	3.83	0.57	0.32	2.94
Pecans	4.00	0.54	0.33	3.13
Pecans with ground cover	4.17	0.68	0.29	3.20
Mixed Vegetables	1.81	0.38	0.25	1.18
Small Grains	1.58	0.37	0.25	0.96
Sudan	2.23	0.28	0.25	1.70
Turf	3.16	0.44	0.33	2.39
Winter Pasture	0.88	0.19	0.33	0.36

Pine Trees

ELEVATION SECTORS 3 AND 4

Alfalfa	3.33	0.66	0.33	2.34
Corn	1.84	0.50	0.25	1.09
Orchard	2.44	0.56	0.33	1.55
Orchard with ground cover	3.70	0.71	0.33	2.66
Pasture	2.69	0.65	0.33	1.71
Pecans				
Pecans with ground cover				
Mixed Vegetables	1.65	0.43	0.25	0.97
Small Grains	0.99	0.56	0.25	0.18
Sudan	1.76	0.49	0.25	1.02
Turf	2.38	0.54	0.33	1.51
Winter Pasture				
Pine Trees	4.03	1.27	0.01	2.75

TABLE C-16

PLEASANT VALLEY/ALPINE RFC
WEIGHTED AVERAGE WATER DUTY DETERMINATION

A. WEIGHTED TOTAL CROP IRRIGATION REQUIREMENT

<u>CROP TYPE</u>	<u>TOTAL OF 1989-1991 SURVEYED ACREAGE</u>	<u>PERCENT OF TOTAL</u>	<u>NET IRRIGATION REQUIREMENT</u>	<u>WEIGHTED NIR</u>
Alfalfa	9.2	1.6	2.34	0.04
Corn	11.8	2.0	1.09	0.02
Orchard	12.6	2.1	1.55	0.03
Orchard with ground cover	10.2	1.7	2.66	0.05
Pasture	431.6	72.7	1.67	1.21
Pine Trees	39.7	6.7	2.75	0.18
Small Grains	39.3	6.6	0.18	0.01
Sudan	30.0	5.0	1.02	0.05
Turf	8.1	1.4	1.51	0.02
Vegetables	1.1	0.2	0.97	0.00
Totals	593.6	100.0		1.61

TABLE C-20

ROOSEVELT/GLOBE RFC
WEIGHTED AVERAGE WATER DUTY DETERMINATION

A. WEIGHTED TOTAL CROP IRRIGATION REQUIREMENT

<u>CROP TYPE</u>	<u>TOTAL OF 1989-1991 SURVEYED ACREAGE</u>	<u>PERCENT OF TOTAL SURVEYED</u>	<u>NET IRRIGATION REQUIREMENT</u>	<u>WEIGHTED NIR</u>
Alfalfa	142.5	11.0	4.12	0.45
Corn	12.3	0.9	0.99	0.01
Orchard	11.9	0.9	2.51	0.02
Orchard with ground cover	47.8	3.7	3.60	0.13
Pasture	888.1	68.4	2.94	2.01
Pecans	4.2	0.3	3.13	0.01
Pecans with ground cover	28.5	2.2	3.2	0.07
Small Grains	34.8	2.7	0.96	0.03
Sudan	13.5	1.1	1.70	0.02
Turf	30.4	2.3	2.39	0.05
Vegetables	3.7	0.3	1.18	0.00
Winter Pasture	79.8	6.20	0.36	0.02
Totals	1297.5	100.0		2.82