

Revision History: Memorandum to File from Patricia Turney dated September 13, 2004 -
Subject: *2003 San Juan River Basin Acreage Inventory*

September 28, 2004: Made addition corrections to spreadsheet Table 2, pages 5 and 6

October 6, 2004: Made changes to column 3 of Table 1 to reflect the addition of Block 8 acres and to adjust the percentages in hydrologic units of Blocks 3 and 6.

December 7, 2004: Revised NIIP data in Table 2 to reflect NIIP acreage by block for the years 2000 through 2003 inclusive, requested of and provided by Ron Bliesner, BIA NIIP consultant and revised the Memorandum's reference to NIIP acreage data.

MEMORANDUM

September 13, 2004

TO: File
FROM: Patricia Turney, NMISC Staff Engineer
SUBJECT: 2003 San Juan River Basin Acreage Inventory

This memorandum summarizes the subject inventory's methodology, collected field data, and analysis. NMISC gratefully acknowledges the assistance of the Navajo and Jicarilla Apache Nations in the field data collection efforts on their respective lands. The 2003 Little Colorado River Basin inventory is described under separate memorandum.

Inventory Methodology:

NMISC staff developed cultivated field delineations from U.S. Geological Survey DOQQs from the most recent National Aerial Photography Program photography available, the majority of which was flown in 1996-97. Because there was no U.S. Geological Survey DOQQ available showing NIIP Block 8, staff used Landsat 5 imagery captured August 12, 2003, and provided by Keller-Bliesner Engineering, BIA NIIP consultant, as a basis for field delineations of the Block 8 area. NMISC contractors Garda Stock and Thelma Yazzie collected crop type and irrigation method information for each parcel and indicated boundary changes where appropriate. NMISC staff input all field-collected data into 2 ArcInfo databases, one based on field delineations from U.S. Geological Survey DOQQs and a second based on field delineations from Landsat 5 imagery of the NIIP Block 8 area. NMISC updated NIIP acreage data on December 7, 2004, with tabular data requested of and provided by Ron Bliesner, BIA NIIP consultant, which data included information on double-cropped acres not available from the aforementioned spatial database. The electronic databases and associated metadata are available from the author.

Inventory Acreage Status:

NMISC contractors found the following irrigated crops and other acreage in the Basin during the summer of 2003. The inventory generally does not include small residential gardens or yards and does not reflect double cropping if any.

Alfalfa	High density single grass
New alfalfa	Low density mixed grass
Lawn/turf	Orchard
Sod	Grapes
Corn	Christmas Trees
Sorghum	Graze out
Garden	Wheat, oats, barley, triticale
Dry beans	Fallow
Potatoes	Plowed
Pumpkins	Conservation Reserve Program
	Wild native vegetation

NMISC staff aggregated the acres found irrigated as follows for purposes of comparing 2003 data with earlier years of inventory level data.

2003 Crop	Aggregated Crop
Alfalfa	Alfalfa
New alfalfa	Alfalfa
Lawn/turf	Sod
Sod	Sod
Corn	Corn/Sorghum
Sorghum	Corn/Sorghum
Garden	Misc. Vegetables
Dry beans	Misc. Vegetables
Potatoes	Misc. Vegetables
Pumpkins	Misc. Vegetables
High-density single grass	Pasture
Low-density mixed grass	Pasture
Orchard	Orchard
Grapes	Orchard
Christmas Trees & Trees	Orchard
Graze out	Small Grains
Wheat, oats, barley, triticale	Small Grains
Fallow/irrigated	Distributed across irrigated small grains, pasture, alfalfa
Plowed/irrigated	Distributed across irrigated small grains, pasture, alfalfa
Not marked or No access	Blank (Distributed across all categories, including not irrigated)

All irrigated plowed parcels and all irrigated fallow parcels were distributed across the irrigated crop categories of small grains, pasture and alfalfa based on the overall cropping pattern for these categories in each irrigation area.

Of the 107,658 acres targeted for field data collection, 522 acres were not field-checked (approximately 0.5% of the total). For analysis purposes, NMISC staff distributed these 522 acres across all acreage categories, including not irrigated acreage, based on the overall cropping pattern for each irrigation area.

Inventory Analysis

Data analysis is contained in the following tables and figure.

- Table 1 lists and describes the hydrologic units and the irrigation areas within each unit.
- Table 2 lists the acreage distribution for the 2003 inventory. Note that columns *Acreage Not Irrigated* and *Total Acreage* do not include acres of the wild, native vegetation category, as did these same columns in the 2000 inventory tabulation. Table 2 was revised on December 7, 2004, as previously described in this memorandum to reflect NIIP acreage by block as provided by Ron Bliesner, BIA NIIP consultant, for the years 2000 through 2003 inclusive.
- Figure 1 shows the mapped extent of the San Juan River Basin 2003 inventory.

TABLE 1. IRRIGATION AREAS IN THE SAN JUAN RIVER BASIN IN NEW MEXICO BY HYDROLOGIC UNIT - 2003

UNIT	DESCRIPTION OF HYDROLOGIC DRAINAGE	IRRIGATION AREAS IN UNIT
1	NAVAJO RIVER, PINE RIVER, AND SAN JUAN RIVER ABOVE NAVAJO DAM	ABOVE NAVAJO DAM
2	ANIMAS RIVER ABOVE THE ANIMAS RIVER AT FARMINGTON GAGE	ANIMAS RIVER
3	SAN JUAN RIVER BELOW NAVAJO DAM AND ABOVE THE SAN JUAN RIVER AT FARMINGTON GAGE (EXCLUDING UNIT 2)	ABOVE ARCHULETA, CITIZEN'S DITCH, ARCHULETA DITCH, TURLEY DITCH, HAMMOND AREA (1), NIIP BLOCKS 1, 4, 5, & 8 (5%), ECHO (2)
4	LA PLATA RIVER ABOVE LA PLATA RIVER NEAR FARMINGTON GAGE	UPPER LA PLATA (3), LA PLATA RIVER
5	CHACO RIVER ABOVE MOUTH	CHACO RIVER, NIIP BLOCKS 3 (89%), 7 (26%) & 8 (84%)
6	SAN JUAN RIVER BELOW THE SAN JUAN RIVER AT FARMINGTON GAGE AND ABOVE THE SAN JUAN RIVER AT SHIPROCK GAGE (EXCLUDING UNITS 4 AND 5)	FARMINGTON GLADE (4), FARMERS MUTUAL DITCH (5), JEWETT VALLEY, WESTWATER, FRUITLAND, HOGBACK-EAST (6), CAMBRIDGE, NIIP BLOCKS 2, 6, 3 (11%), 7 (74%) & 8 (11%)
7	SAN JUAN RIVER BELOW THE SAN JUAN RIVER AT SHIPROCK GAGE (EXCLUDING UNIT 8)	HOGBACK-WEST (7), CUDEI
8	WHISKEY CREEK DRAINAGE, RED WASH	WHISKEY CREEK

NOTES:

- (1) INCLUDES HAMMOND PROJECT AND ACREAGE WITH PRIVATE WATER RIGHTS EXCLUSIVE FROM THE HAMMOND PROJECT.
- (2) INCLUDES ONLY THAT PORTION OF ACREAGE SERVED BY ANY DITCH DIVERSION FROM ANIMAS RIVER FOR WHICH RETURN FLOW OCCURS BELOW THE ANIMAS RIVER AT FARMINGTON GAGE OR TO THE SAN JUAN RIVER ABOVE THE MOUTH OF THE ANIMAS RIVER
- (3) INCLUDES ONLY ACREAGE SERVED BY DIVERSIONS FROM THE LA PLATA RIVER ABOVE THE LA PLATA RIVER AT STATELINE GAGE. THE ENTERPRISE DITCH SERVES LANDS IN THIS AREA AND IN COLORADO.
- (4) INCLUDES ONLY ACREAGE SERVED BY DIVERSION FROM ANIMAS RIVER FOR WHICH RETURN FLOW OCCURS TO THE SAN JUAN RIVER BELOW THE SAN JUAN RIVER AT FARMINGTON GAGE.
- (5) DIVERSION SERVING THIS AREA IS FROM ANIMAS RIVER BELOW THE ANIMAS RIVER AT FARMINGTON GAGE AND IS SUPPLEMENTED BY DIVERSION FROM THE SAN JUAN RIVER BELOW THE SAN JUAN RIVER AT FARMINGTON GAGE.
- (6) INCLUDES ONLY THAT PORTION OF THE HOGBACK PROJECT ABOVE SHIPROCK.
- (7) INCLUDES ONLY THAT PORTION OF THE HOGBACK PROJECT BELOW SHIPROCK, INCLUDING THE HOGBACK EXTENSION, WHICH IS SERVED BY DIVERSION FROM THE SAN JUAN RIVER ABOVE THE SAN JUAN RIVER AT SHIPROCK GAGE.
- (8) THE WHISKEY CREEK DRAINAGE INCLUDES THE CRYSTAL, NEW MEXICO AREA THAT DRAINS TO CHINLE WASH. ITS CONFLUENCE WITH THE SAN JUAN RIVER IS LOCATED BELOW BLUFF, UTAH. THE RED WASH CONFLUENCE WITH THE SAN JUAN RIVER IS LOCATED IN NEW MEXICO JUST EAST OF THE ARIZONA-NEW MEXICO STATE LINE.

TABLE 2. 2003 CROP ACREAGE DATA FOR THE SAN JUAN RIVER BASIN IN NEW MEXICO BY AREA

HYDROLOGIC UNIT	IRRIGATION AREA	ITEM	CROP CATEGORY										TOTAL ACREAGE IRRIGATED	ACREAGE NOT IRRIGATED	TOTAL ACREAGE
			ALFALFA	CORN/ SORGHUM	MISC. VEGET.	ORCHARD	PASTURE	SMALL GRAINS	SOD	IRRIGATED	NOT IRRIGATED	ACREAGE			
1	ABOVE NAVAJO DAM	TOTAL ACRES	35	0	1	0	291	0	0	0	0	0	326	192	518
		% DISTRIB.	11	0	0	0	89	0	0	0	0	0			
			Flood-irrigated	30	0	1	0	197	0	0	0	0	0	228	
		Sprinkler-irrigated	5	0	0	0	93	0	0	0	0	98			
		Drip-irrigated	0	0	0	0	0	0	0	0	0	0			
1	DULCE	TOTAL ACRES	0	0	1	0	0	0	0	0	0	0	1	65	66
		% DISTRIB.	0	0	100	0	0	0	0	0	0	0			
			Flood-irrigated	0	0	1	0	0	0	0	0	0	0	1	
		Sprinkler-irrigated	0	0	0	0	0	0	0	0	0	0			
		Drip-irrigated	0	0	0	0	0	0	0	0	0	0			
2	ANIMAS RIVER	TOTAL ACRES	1,906	6	95	66	2,529	65	436	5,104	542	5,646			
		% DISTRIB.	37	0	2	1	50	1	9						
			Flood-irrigated	1,423	6	64	56	2,008	65	7	3,630				
		Sprinkler-irrigated	484	0	30	7	521	0	429	1,471					
		Drip-irrigated	0	0	0	3	0	0	0	0	3				
3	ECHO	TOTAL ACRES	173	0	14	25	170	0	23	405	18	423			
		% DISTRIB.	43	0	3	6	42	0	6						
			Flood-irrigated	74	0	14	25	162	0	0	275				
		Sprinkler-irrigated	99	0	0	0	8	0	23	131					
		Drip-irrigated	0	0	0	0	0	0	0	0					
3	ARCHULETA DITCH	TOTAL ACRES	4	0	0	0	0	0	0	4	4	8			
		% DISTRIB.	100	0	0	0	0	0	0						
			Flood-irrigated	4	0	0	0	0	0	0	4				
		Sprinkler-irrigated	0	0	0	0	0	0	0	0					
		Drip-irrigated	0	0	0	0	0	0	0						

TABLE 2. 2003 CROP ACREAGE DATA FOR THE SAN JUAN RIVER BASIN IN NEW MEXICO BY AREA

HYDROLOGIC UNIT	IRRIGATION AREA	ITEM	CROP CATEGORY										TOTAL ACREAGE IRRIGATED	ACREAGE NOT IRRIGATED	TOTAL ACREAGE
			ALFALFA	CORN/ SORGHUM	MISC. VEGET.	ORCHARD	PASTURE	SMALL GRAINS	SOD	IRRIGATED	IRRIGATED	ACREAGE			
3	CITIZENS DITCH	TOTAL ACRES	1,052	6	36	33	1,226	0	106	2,459	254	2,713			
		% DISTRIB.	43	0	1	1	50	0	4						
		Flood-irrigated	356	0	21	4	797	0	2	1,180					
		Sprinkler-irrigated	696	6	11	28	430	0	104	1,274	5				
		Drip-irrigated	0	0	5	1	0	0	0	0	0				
3	TURLEY DITCH	TOTAL ACRES	65	0	1	0	55	0	1	122	7	129			
		% DISTRIB.	53	0	1	0	45	0	1						
		Flood-irrigated	64	0	1	0	38	0	0	102					
		Sprinkler-irrigated	2	0	0	0	18	0	1	20					
		Drip-irrigated	0	0	0	0	0	0	0	0					
3	HAMMOND	TOTAL ACRES	2,315	22	211	8	692	1	27	3,277	216	3,493			
		% DISTRIB.	71	1	6	0	21	0	1						
		Flood-irrigated	198	0	12	2	42	0	0	254					
		Sprinkler-irrigated	2,117	22	200	6	650	1	27	3,023	0				
		Drip-irrigated	0	0	0	0	0	0	0	0					
3	NIIP	TOTAL ACRES	4,759	5,729	5,994	0	0	4,826	397	21,706	8,146	29,852			
		% DISTRIB.	22	26	28	0	0	22	2						
		Flood-irrigated	1	0	0	0	46	0	2	49					
		Sprinkler-irrigated	56	0	0	0	0	0	56						
		Drip-irrigated	0	0	0	0	0	0	0						
4	UPPER LA PLATA	TOTAL ACRES	57	0	0	0	46	0	2	105	7	112			
		% DISTRIB.	54	0	0	0	44	0	2						
		Flood-irrigated	1	0	0	0	46	0	2	49					
		Sprinkler-irrigated	56	0	0	0	0	0	56						
		Drip-irrigated	0	0	0	0	0	0	0						
4	LA PLATA RIVER	TOTAL ACRES	1,174	0	0	0	530	24	1	1,730	1,120	2,850			
		% DISTRIB.	68	0	0	0	31	1	0						
		Flood-irrigated	981	0	0	0	428	16	1	1,427					
		Sprinkler-irrigated	193	0	0	102	8	0	303						
		Drip-irrigated	0	0	0	0	0	0	0						

TABLE 2. 2003 CROP ACREAGE DATA FOR THE SAN JUAN RIVER BASIN IN NEW MEXICO BY AREA

HYDROLOGIC UNIT	IRRIGATION AREA	ITEM	CROP CATEGORY										TOTAL ACREAGE IRRIGATED	ACREAGE NOT IRRIGATED	TOTAL ACREAGE
			ALFALFA	CORN/ SORGHUM	MISC. VEGET.	ORCHARD	PASTURE	SMALL GRAINS	SOD	IRRIGATED	IRRIGATED	ACREAGE			
5	CHACO RIVER	TOTAL ACRES	194	218	13	3	2	11	14	456	1,877	2,333			
		% DISTRIB.	43	48	3	1	0	2	3						
		Flood-irrigated	194	218	13	3	2	11	0	442					
		Sprinkler-irrigated	0	0	0	0	0	0	14	14					
		Drip-irrigated	0	0	0	0	0	0	0						
5	NIIP	TOTAL ACRES	535	4,018	4,032	0	0	4,463	0	13,049	1,261	14,310			
		% DISTRIB.	27	47	11	0	0	14	0						
		Flood-irrigated	1,200	27	49	17	751	36	26	2,105					
		Sprinkler-irrigated	15	0	0	0	0	37	55	106					
		Drip-irrigated	0	0	0	0	0	0	0						
6	FARMERS MUTUAL DITCH	TOTAL ACRES	1,215	27	49	17	751	72	81	2,211	128	2,338			
		% DISTRIB.	55	1	2	1	34	3	4						
		Flood-irrigated	578	26	0	4	109	46	1	764					
		Sprinkler-irrigated	27	0	0	0	0	0	115	142					
		Drip-irrigated	0	0	0	0	0	0	0						
6	JEWETT VALLEY DITCH	TOTAL ACRES	605	26	0	4	109	46	116	906	88	993			
		% DISTRIB.	67	3	0	0	12	5	13						
		Flood-irrigated	578	26	0	4	109	46	1	764					
		Sprinkler-irrigated	27	0	0	0	0	115	142						
		Drip-irrigated	0	0	0	0	0	0	0						
6	WESTWATER	TOTAL ACRES	60	0	0	0	0	0	0	60	0	60			
		% DISTRIB.	100	0	0	0	0	0	0	100					
		Flood-irrigated	60	0	0	0	0	0	0	60					
		Sprinkler-irrigated	0	0	0	0	0	0	0						
		Drip-irrigated	0	0	0	0	0	0	0						
6	CAMBRIDGE	TOTAL ACRES	9	7	0	0	17	0	0	33	30	63			
		% DISTRIB.	26	23	0	0	51	0	0						
		Flood-irrigated	9	7	0	0	17	0	0	33					
		Sprinkler-irrigated	0	0	0	0	0	0	0						
		Drip-irrigated	0	0	0	0	0	0	0						

TABLE 2. 2003 CROP ACREAGE DATA FOR THE SAN JUAN RIVER BASIN IN NEW MEXICO BY AREA

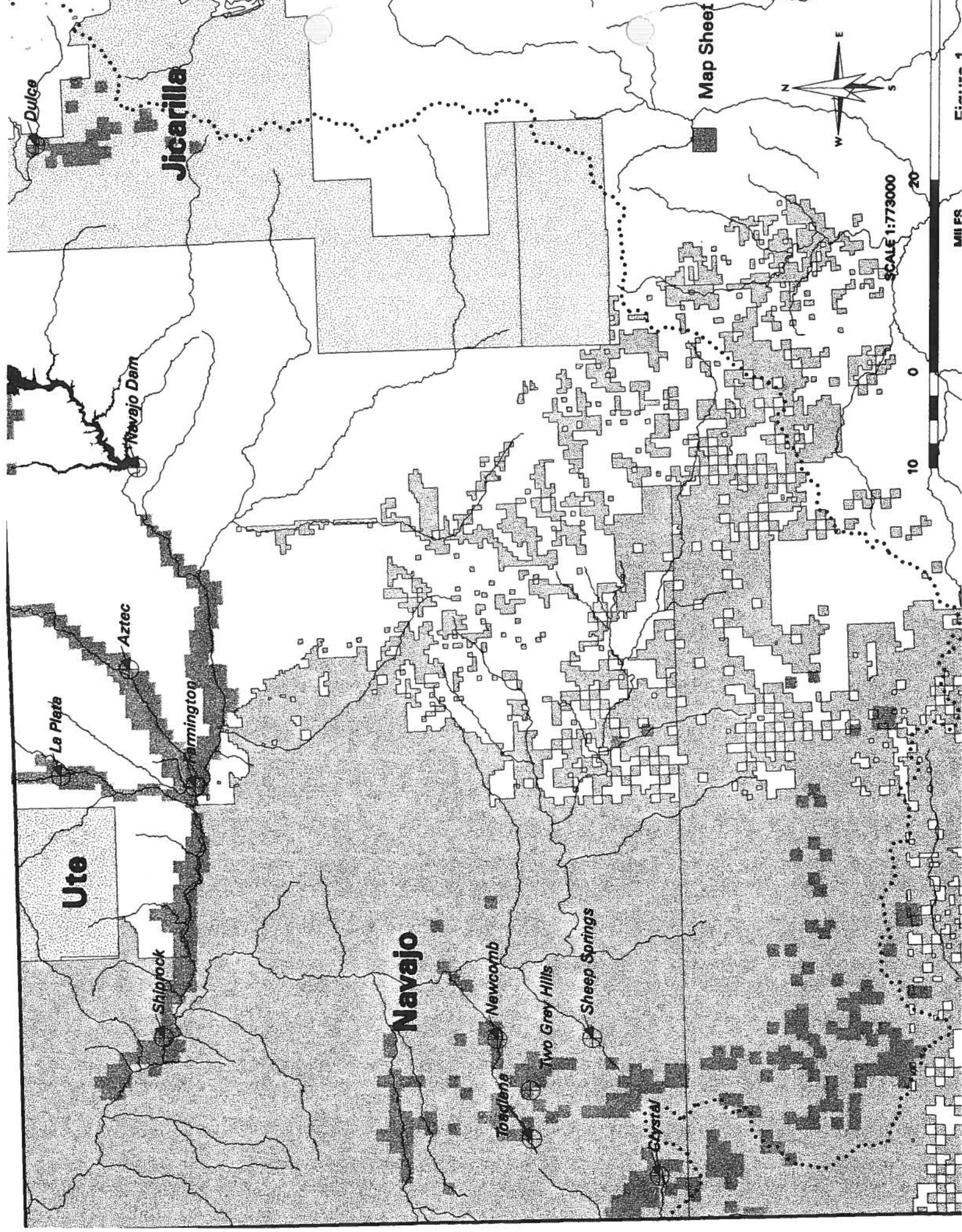
HYDROLOGIC UNIT	IRRIGATION AREA	ITEM	CROP CATEGORY										TOTAL ACREAGE IRRIGATED	ACREAGE NOT IRRIGATED	TOTAL ACREAGE
			ALFALFA	CORN/ SORGHUM	MISC. VEGET.	ORCHARD	PASTURE	SMALL GRAINS	SOD	IRRIGATED	IRRIGATED	ACREAGE			
6	FRUITLAND	TOTAL ACRES	1,310	407	44	5	179	37	0	0	1,982	752	2,734		
		% DISTRIB.	66	21	2	0	9	2	0	0					
		Flood-irrigated	1,287	407	44	5	179	37	0	0	1,960				
		Sprinkler-irrigated	23	0	0	0	0	0	0	23					
		Drip-irrigated	0	0	0	0	0	0	0	0					
6	HOGBACK-EAST	TOTAL ACRES	605	215	20	3	112	0	8	963	487	1,450			
		% DISTRIB.	63	22	2	0	12	0	1						
		Flood-irrigated	601	215	20	3	112	0	5	957					
		Sprinkler-irrigated	4	0	0	0	0	3	6						
		Drip-irrigated	0	0	0	0	0	0	0						
6	FARMINGTON GLADE	TOTAL ACRES	4	0	0	20	34	0	42	101	25	126			
		% DISTRIB.	4	0	0	20	34	0	42						
		Flood-irrigated	4	0	0	20	34	0	4	62					
		Sprinkler-irrigated	0	0	0	0	0	39	39						
		Drip-irrigated	0	0	0	0	0	0	0						
6	NIIP	TOTAL ACRES	6,830	5,306	3,140	267	0	4,971	0	20,514	3,715	24,229			
		% DISTRIB.	29	32	19	0	0	19	0						
		Flood-irrigated	1,058	509	30	6	190	0	3	1,796					
		Sprinkler-irrigated	3	0	0	0	6	8	17						
		Drip-irrigated	0	0	0	0	0	0	0						
7	HOGBACK-WEST	TOTAL ACRES	1,061	509	30	6	195	0	11	1,813	712	2,525			
		% DISTRIB.	59	28	2	0	11	0	1						
		Flood-irrigated	1,058	509	30	6	190	0	3	1,796					
		Sprinkler-irrigated	3	0	0	0	6	8	17						
		Drip-irrigated	0	0	0	0	0	0	0						
7	CUDEI	TOTAL ACRES	231	25	9	5	123	0	0	393	39	432			
		% DISTRIB.	59	6	2	1	31	0	0						
		Flood-irrigated	231	25	9	5	123	0	0	393					
		Sprinkler-irrigated	0	0	0	0	0	0	0						
		Drip-irrigated	0	0	0	0	0	0	0						

TABLE 2. 2003 CROP ACREAGE DATA FOR THE SAN JUAN RIVER BASIN IN NEW MEXICO BY AREA

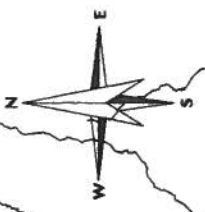
HYDROLOGIC UNIT	IRRIGATION AREA	ITEM	CROP CATEGORY										TOTAL ACREAGE IRRIGATED	ACREAGE NOT IRRIGATED	TOTAL ACREAGE		
			ALFALFA	CORN/ SORGHUM	MISC. VEGET.	ORCHARD	PASTURE	SMALL GRAINS	SOD	IRRIGATED	NOT IRRIGATED	ACREAGE					
8	WHISKEY CREEK	TOTAL ACRES % DISTRIB.	0	0	0	0	0	0	0	0	0	0	0	0	0	470	470
		<i>Flood-irrigated</i>	0	0	0	0	0	0	0	0	0	0	0	0	0		
		<i>Sprinkler-irrigated</i>	0	0	0	0	0	0	0	0	0	0	0	0	0		
		<i>Drip-irrigated</i>	0	0	0	0	0	0	0	0	0	0	0	0	0		
	ARCHULETA DITCH, CITIZENS DITCH TURLEY DITCH, HAMMOND FARMERS MUTUAL DITCH	TOTAL ACRES % DISTRIB.	5,316 59	81 1	297 3	61 1	2,833 31	120 1	331 4	9,039	696	9,735					
		<i>Flood-irrigated</i>															
		<i>Sprinkler-irrigated</i>															
		<i>Drip-irrigated</i>															
	JEWETT VALLEY AND WESTWATER COMBINED	TOTAL ACRES % DISTRIB.	2,461 2,856	53 28	82 210	26 34	1,736 1,097	82 38	29 302	4,468 4,565	5						
		<i>Flood-irrigated</i>															
		<i>Sprinkler-irrigated</i>															
		<i>Drip-irrigated</i>															
	ANIMAS RIVER, ECHO, AND FARMINGTON GLADE COMBINED	TOTAL ACRES % DISTRIB.	2,084 37	6 0	109 2	112 2	2,733 49	65 1	502 9	5,610	584	6,195					
		<i>Flood-irrigated</i>	1,501	6	78	101	2,204	65	11	3,967							
		<i>Sprinkler-irrigated</i>	583	0	31	7	529	0	491	1,641							
		<i>Drip-irrigated</i>	0	0	0	3	0	0	0	3							
	UPPER LA PLATA AND LA PLATA RIVER COMBINED	TOTAL ACRES % DISTRIB.	1,231 67	0 0	0 0	0 0	576 31	24 1	3	1,835	1,127	2,962					
		<i>Flood-irrigated</i>	983	0	0	0	474	16	3	1,476							
		<i>Sprinkler-irrigated</i>	249	0	0	0	102	8	0	359							
		<i>Drip-irrigated</i>	0	0	0	0	0	0	0	0							
	FRUITLAND, CAMBRIDGE AND HOGBACK-EAST COMBINED	TOTAL ACRES % DISTRIB.	1,924 65	630 21	64 2	8 0	309 10	37 1	8	2,979	1,269	4,247					
		<i>Flood-irrigated</i>	1,897	630	64	8	309	37	5	2,950							
		<i>Sprinkler-irrigated</i>	26	0	0	0	0	0	3	29							
		<i>Drip-irrigated</i>	0	0	0	0	0	0	0	0							

TABLE 2. 2003 CROP ACREAGE DATA FOR THE SAN JUAN RIVER BASIN IN NEW MEXICO BY AREA

HYDROLOGIC UNIT	IRRIGATION AREA	ITEM	CROP CATEGORY										TOTAL ACREAGE IRRIGATED	ACREAGE NOT IRRIGATED	TOTAL ACREAGE	
			ALFALFA	CORN/ SORGHUM	MISC. VEGET.	ORCHARD	PASTURE	SMALL GRAINS	SOD	IRRIGATED	IRRIGATED	IRRIGATED				
HOGBACK-WEST AND CUDEI COMBINED	TOTAL ACREES % DISTRIB.	<i>Flood-irrigated</i>	1,290	534	39	11	312	0	3	2,189						
		<i>Sprinkler-irrigated</i>	3	0	0	0	6	0	8	17						
		<i>Drip-irrigated</i>	0	0	0	0	0	0	0	0						
NAVAJO INDIAN IRRIGATION PROJECT	ACRES % DISTRIB.		12,125	15,054	13,165	267	0	14,260	397	55,269						68,390
			22	27	24	0	0	26	1	100						
		<i>Sprinkler-irrigated</i>	12,125	15,054	13,165	267	0	14,260	397	55,269						13,121



Map Sheet



SCALE 1:773000



MILES

Figure 4