



DIVISION OF WATER RESOURCES
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Water-Related
Land Use
Inventories

Utah

*Great Salt Lake
Desert
Study Unit*

A WATER-RELATED
LAND USE INVENTORY REPORT
of the
GREAT SALT LAKE DESERT STUDY UNIT

Aerial Photography and Field Mapping
Conducted in 1989

Prepared by

Utah Department of Natural Resources
Division of Water Resources

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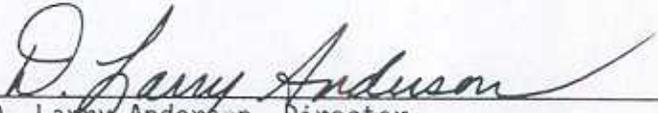

D. Larry Anderson, Director

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SUMMARY

This Water-Related Land Use Inventory Report of the Great Salt Lake Desert Study Unit is another in a series of land use reports prepared by the Division of Water Resources from data collected under its water-related land use inventory program. The land use inventory program of the division was set up to provide the land use data needed in the preparation of water budgets, hydrologic inventory reports and other state water planning activities. The division has collected land use data since 1966.

The water-related land use data for the Great Salt Lake Desert Study Unit were collected in 1989 by the Division of Water Resources. The report displays the data by subarea (see Figures 5 through 19) and tabulates it by subarea and county in Tables 2 and 3, respectively. The tables are presented in this summary as Tables i and ii, respectively.

The division inventoried over 1,818,873 acres of land in the Great Salt Lake Desert Study Unit. This represents about 15.8 percent of the entire Basin. Areas not inventoried are mainly desert, rangeland or national forests. Of the inventoried acres, 88,490 were irrigated land (including land that was fallow, idle or sub-irrigated), 368,259 were wet/open water areas (excluding the Great Salt Lake and the West Desert Pond), and 13,078 were residential or industrial areas (including farmsteads and rural housing).

In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total

Table 1. Summary of land cover by subarea for the Great Salt Lake Desert Study Unit (acres).

Code	Cover	Grouse Cr. 01-01-001	Park Valley 01-01-002	Curlew Valley 01-01-003	No. GSL Desert 01-02-001	So. GSL Desert 01-02-002	Deep Creek 01-02-003	Snake Valley 01-03-001	Tule Valley 01-03-002
IA1a	Fruit	0	0	0	0	0	0	17	0
IA1e	Other Horticulture	0	0	0	0	0	0	0	0
IA2a	Grain	229	1,385	5,227	0	0	23	513	0
IA2b1	Corn	0	0	0	16	36	0	13	0
IA2b	Vegetables	0	0	0	0	0	0	0	0
IA2b1	Potatoes	0	0	0	0	0	0	0	0
IA2b2	Onions	0	0	0	0	0	0	0	0
IA2b3	Beans	0	0	0	0	0	0	0	0
IA2c	Other Row Crops	0	0	0	0	0	0	0	0
IA3a	Alfalfa	2,110	3,308	10,220	222	546	253	2,578	0
IA3b	Grass Hay	459	685	246	0	917	0	22	0
IA3c	Grass/Turf	0	0	0	0	0	0	0	0
IA3d	Pasture	1,306	1,365	340	236	437	3,968	2,533	0
IA4a	Fallow	0	87	772	0	0	0	36	0
IA4b	Idle Overgrown	668	1,213	4,065	81	897	539	968	0
IIA1a	Pasture (surf. & sub.)	0	237	197	0	515	0	1,057	0
IIA1b	Grass Hay (surf. & sub.)	0	408	0	0	0	0	0	0
Surface Irr. Cropland Subtotal		4,772	8,688	21,067	555	3,348	4,783	7,737	0
IIA2a	Sub. Irr. Pasture	0	0	0	0	317	0	0	0
IIA2b	Sub. Irr. Grass Hay	0	0	0	0	0	0	0	0
Sub. Irr. Cropland Subtotal		0	0	0	0	317	0	0	0
Irrigated Croplands Subtotal		4,772	8,688	21,067	555	3,665	4,783	7,737	0
IIB	Cattail/Bullrush Aspect	24	483	0	0	5,659	0	0	0
IIB-E	Wet/Vegetation Asp.	0	0	0	9,570	0	0	0	0
IIIC	Wet Flats	51	67	0	0	11,187	0	13	0
IIIE	Riparian	116	0	97	0	347	0	207	0
IIIF	Open Water	45	21	1,231	0	1,851	2	272	0
IIF2	Reservoirs	0	0	0	0	0	0	0	0
IIF4a	Temporary Flooded	0	0	0	0	41	0	0	0
IIF4b	Sewage Lagoon	0	0	0	0	0	0	0	0
IIF4c	Evaporation Pond	0	0	0	17,426	21,695	0	0	0
IIF5	Salt Water	19	25,038	0	344,076	0	0	0	0
Wet/Open Water Subtotal		255	25,609	1,328	371,072	40,780	2	492	0
VA	Farmsteads	35	163	327	0	111	65	243	0
VB	Residential	78	31	93	0	166	18	50	0
VB3	Open Spaces	0	0	3	0	0	0	0	0
VC	Commercial/Industrial	0	0	40	0	1,396	0	13	0
Residential/Industrial Subtotal		113	194	463	0	1,673	103	306	0
Land Use/Land Cover Totals		5,140	34,491	22,858	371,627	46,118	4,888	8,535	0

Footnotes for Table i.

Summary of land cover by subarea for the Great Salt Lake Desert Study Unit.

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

²Some evaporation ponds were not photographed with 35 mm slides. Data were obtained from LANDSAT imagery.

³The Salt Water category includes: the Great Salt Lake, Evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217').

Table i. Continued.

Code	Cover	Skull Valley 01-04-001	Rush Valley 01-05-001	Tooele Valley 01-05-002	Great Salt Lake 01-006	Hansel Valley 01-07-001	Blue Creek 01-07-002	Promontory Point 01-07-003	Total
I1Aa	Fruit	0	0	2	0	0	0	0	19
I1Ae	Other Horticulture	0	0	0	0	0	0	0	0
I1Aa	Grain	47	508	2,793	0	0	0	0	12,078
I1Aa1	Corn	0	0	382	0	0	1,353	0	447
I1A2b	Vegetables	0	0	0	0	0	0	0	0
I1A2b1	Potatoes	0	0	4	0	0	0	0	4
I1A2b2	Onions	0	0	0	0	0	0	0	0
I1A2b3	Beans	0	0	0	0	0	0	0	0
I1A2c	Other Row Crops	0	0	0	0	0	0	0	0
I1A3a	Alfalfa	1,554	2,803	4,667	0	112	1,103	28	29,504
I1A3b	Grass Hay	48	290	1,020	0	11	222	0	3,920
I1A3c	Grass/Turf	0	75	0	0	0	0	0	75
I1A3d	Pasture	334	3,520	4,669	0	14	557	84	19,363
I1A4a	Fallow	0	1,618	777	0	0	123	0	3,413
I1A4b	Idle Overgrown	137	1,115	1,355	0	0	159	0	11,207
I1A1a	Pasture (surf. & sub.)	177	298	256	0	0	1,543	3,307	7,587
I1A1b	Grass Hay (surf. & sub.)	0	0	0	0	0	0	0	408
Surface Irr. Cropland Subtotal		2,297	10,227	15,925	0	137	5,070	3,419	88,025
I1A2a	Sub. Irr. Pasture	0	72	0	0	0	0	0	455
I1A2b	Sub. Irr. Grass Hay	0	0	0	0	0	0	0	0
Sub. Irr. Cropland Subtotal		0	72	0	0	0	0	0	455
Irrigated Croplands Subtotal		2,297	10,299	15,925	0	137	5,070	3,495	88,490
I1B	Cattail/Bullrush Aspect	0	0	12	0	0	0	0	6,703
I1B-E	Wet/Vegetation Asp.	0	0	0	25,525	0	88	19,174	55,357
I1C	Wet Flats	0	0	7	28,663	0	43	4,366	44,397
I1E	Riparian	0	215	210	0	0	0	0	1,274
I1F	Open Water	10	2,722	378	149	0	180	347	7,208
I1F2	Reservoirs	0	0	0	4,967	0	0	0	4,967
I1F4a	Temporary Flooded	0	0	107	1	0	0	0	108
I1F4b	Sewage Lagoon	0	0	0	0	0	8	0	49
I1F4c	Evaporation Pond	0	0	2,572	0	0	0	0	41,693
I1F5	Salt Water	0	0	121	1,062,585	0	0	2,293	1,434,132
Wet/Open Water Subtotal		10	2,937	3,407	1,122,910	0	351	26,705	1,595,858
VA	Farmsteads	150	157	493	0	82	230	95	2,171
VB	Residential	14	474	4,567	0	0	66	20	5,577
VB3	Open Spaces	0	7	323	0	0	0	0	333
VC	Commercial/Industrial	74	88	457	0	0	2,929	0	4,997
Residential/Industrial Subtotal		238	726	5,840	0	82	3,225	115	13,078
Land Use/Land Cover Totals		2,545	13,962	25,172	1,122,910	219	8,646	30,315	1,697,426

¹See opposite page.

²See opposite page.

³See opposite page.

Footnotes for Table ii.

Summary of land cover by county for the Great Salt Lake Desert Study Unit.

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

²Some evaporation ponds were not photographed with 35 mm slides. Data were obtained from LANDSAT imagery.

³The Salt Water category includes: the Great Salt Lake, Evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217').

numbers of acres in the subarea. The Salt Water category includes the Great Salt Lake, evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217'). Evaporation ponds outside the shoreline of the Great Salt Lake such as those used by Kennecott or American Salt are not included in the Salt Water category but are included in other categories. Non-irrigated agricultural lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are often not mapped. Acres shown for this category reflect only the number of acres mapped, not the number of acres that may be in this category in the basin. Dry land agriculture (grain, beans, safflowers, etc.) represents only a small part of the total agriculture in this area of the state. The division mapped 121,040 acres under dry land agriculture in the Great Salt Lake Desert Study Unit.

This report also discusses the Division of Water Resources previous and present methodology of collecting and processing water-related land use data. It discusses the various land use classification codes used in past studies, and what is now considered the Standard Land Use Codes, which the division adopted in 1988 for all land use/land cover studies.

The information should be valuable to a variety of users, including county and city planners, state and federal agencies and private land owners. The division will use the data in water budget reports and in state water planning reports.

INTRODUCTION

The Division of Water Resources has been charged by the Utah State Legislature with the responsibility of developing a state water plan. This plan would coordinate and give direction to the activities of state and federal agencies concerned with Utah's water resources. To accomplish this objective, an assessment of the land use and available water resources is being made on a continuing basis. As a basis for planning and further development, the state has been divided into 11 natural drainage basins or study units shown in Figure 1. The South and East Colorado River Basin (originally designated basin No. 9) has been divided into the Southeast Colorado River Basin (retaining designation No. 9) and the Kanab Creek/Virgin River Basin (Lower Colorado River Basin), which is now basin No. 10.

While land use inventories contain information on land use in the state, water budget reports contain climate, hydrologic, and general information on the water resources within specific basins or study units. The water budgets provide an accounting of water inflow, outflow, yield, storage, evaporation, transpiration and uses in the study area. Hydrologic inventories and water budget reports currently published by the division are listed in Appendix A.

A major consideration in preparing water budgets is the quantity of water depleted through evaporation and transpiration. Estimates of these depletions are obtained by preparing water budgets from data gathered in the water-related land use inventories. This data includes the kinds and extent of irrigated crops, as well as similar information on phreatophytes, wet/open water areas and residential/industrial areas. Since 1966, the division has conducted water-related land use and hydrologic inventories in conjunction with other state water planning activities.

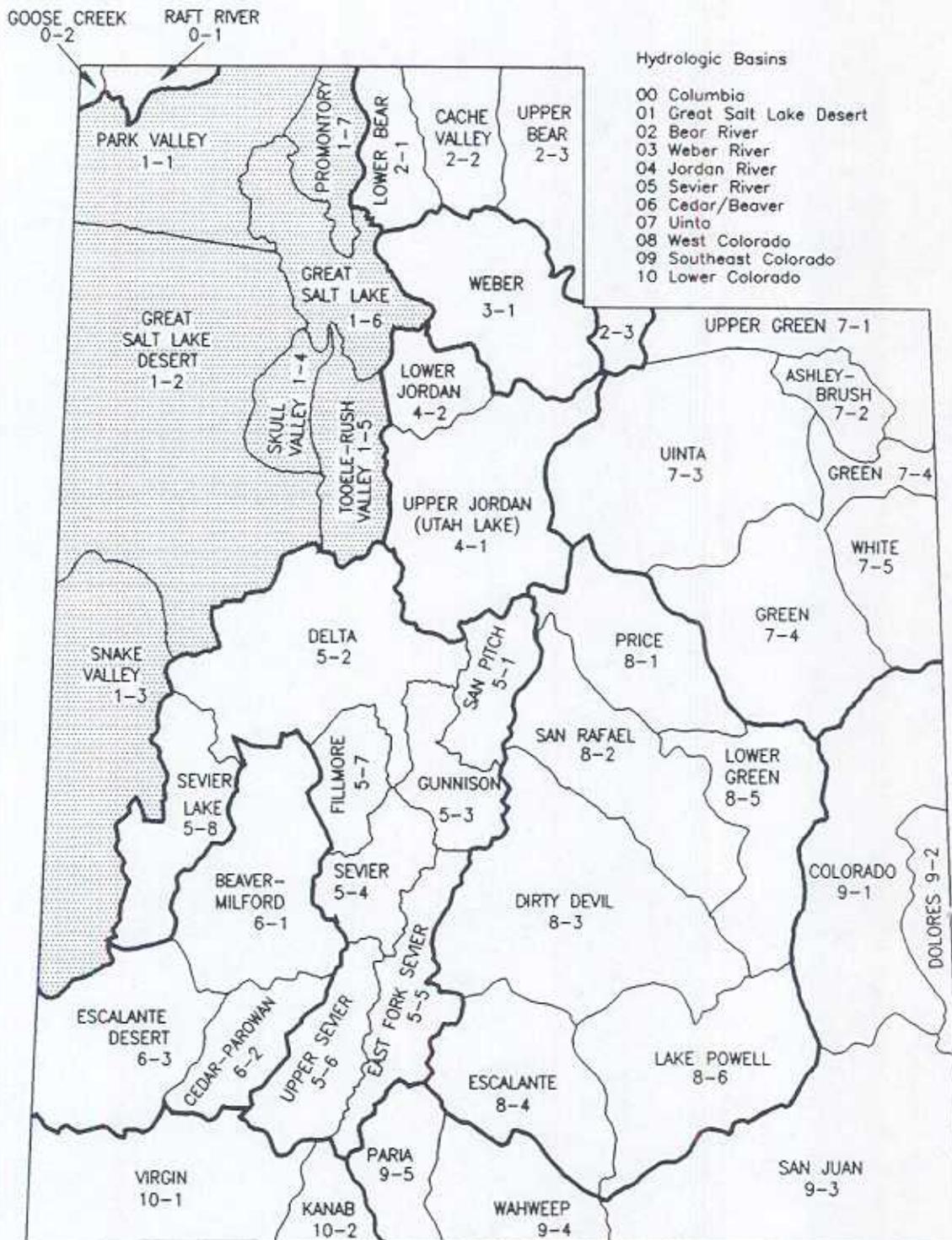


Figure 1. Hydrologic basins and study areas in the State of Utah with the Great Salt Lake Desert Study Unit highlighted.

This land use report should assist in promoting the coordinated and orderly development, conservation, use and management of water and land resources in the Great Salt Lake Desert Study Unit.

GREAT SALT LAKE DESERT STUDY UNIT WATER-RELATED LAND USE INVENTORY

The Great Salt Lake Desert Water-Related Land Use Inventory study unit was shown in Figure 1. Figure 2 shows the Study Unit divided into separate hydrologic subareas. The study unit includes approximately 18,003 square miles of land lying between 37°50' to 42°00' latitude, and 112°20' to 114°00' longitude, and includes parts of Beaver County, Box Elder County, Davis County, Iron County, Juab County, Millard County, Salt Lake County, Tooele County and Weber County. Figure 3 shows the Great Salt Lake Desert Study Unit overlaid with a template showing the 7-1/2 min. USGS quadrangle maps used in the inventory. The state Automated Geographic Reference Center's (AGRC) reference numbers are cross-referenced with the division's reference number and the quadrangle name.

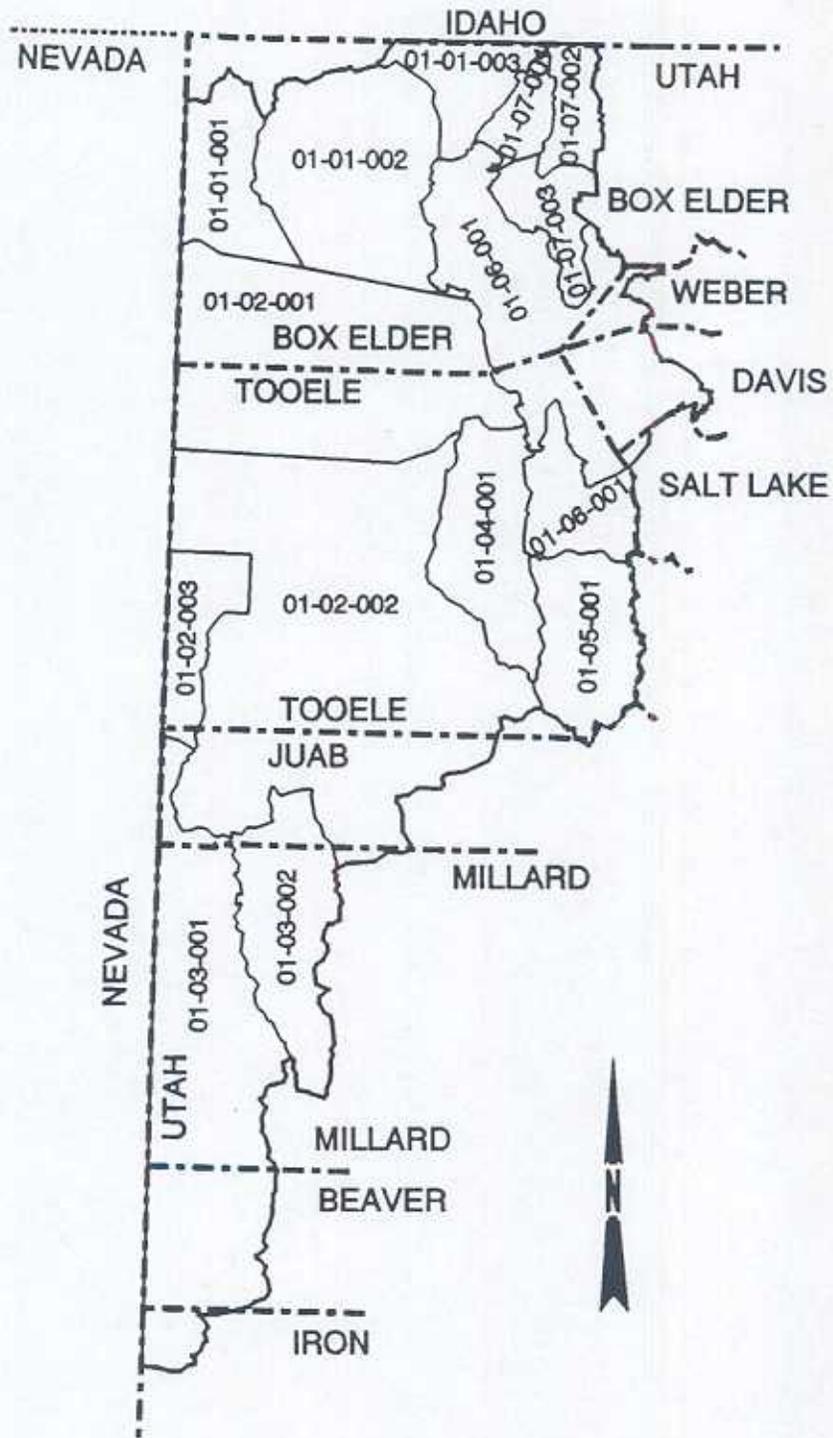


Figure 2. Hydrologic subareas of the Great Salt Lake Desert Study Unit.

List of 7-1/2 Minute Quadrangles by Name for Figure 3.

List No.	Quadrangle Name	AGIC Code	DNR Code	List No.	Quadrangle Name	AGIC Code	DNR Code	List No.	Quadrangle Name	AGIC Code	DNR Code	List No.	Quadrangle Name	AGIC Code	DNR Code
1	Pole Creek	303 A01		64	Sheep Mountain	708 A08		127	Graham Peak	1104 002		190	Toole	1416 E30	
2	Condon Thomas Basin	304 A02		65	Floating Island West	709 A09		128	Floating Island NE	1105 003		191	Bingham Canyon	1417 E31	
3	Standard	307 A05		66	Dolphin Island East	710 A10		129	Knoles 2 NW	1107 004		192	Ferguson Peak	1815 E81	
4	Rosevare Point	308 A06		67	Gumison Island NE	711 B03		130	Knoles 2 E	1108 005		193	Geopette Mch	1817 E83	
5	Kallon Pass	309 A07		68	Gumison Island NE	712 B34		131	Finger Ridge	1108 006		194	Geopette Mch	1902 101	
6	Curlew Junction	310 A08		69	Roze Point	713 B35		132	Grassy Mountain	1109 007		195	Goshute Canyon	1904 102	
7	Monument Peak NW	311 B01		70	Heaxix Peak	714 B36		133	Pudlie Valley Knolls	1110 008		196	Wichit Mountain	1905 103	
8	Monument Peak NE	312 B02		71	East Promontory	715 B37		134	Cranner Peak	1111 001		197	Wichit Mountain	1906 104	
9	Snowflake	313 B03		72	Mouth of Bear River	716 B38		135	Budger Island	1112 002		198	Wig Mountain	1907 105	
10	Terrace Pass	314 B04		73	Lucin	802 A11		136	Badger Island	1113 003		199	Wig Mountain	1908 106	
11	Riddell Pass	315 B05		74	Pigeon Mountain	803 A12		137	Plug Peak NW	1114 004		200	Wig Mountain	1909 108	
12	Liacklin Knoll	402 A09A		75	Jackson	804 A13		138	Plug Peak NE	1115 005		201	Hibban Knolls	1911 101	
13	Judd Mountain	403 A09		76	Bovine SE	805 A14		139	Antelope Island	1116 006		202	Deart Peak West	1912 102	
14	Dry Canyon Mountain	404 A10		77	Lemy	806 A15		140	Saltair NE	1117 007		203	Coyote Springs	1913 103	
15	Knaball Creek	405 A11		78	Groom	807 A16		141	Fleming	1118 008		204	Indian Springs	1914 104	
16	Lynn Reservoir	406 A12		79	Headow Spring	808 A17		142	Leppington	1119 001		205	South Mountain	1915 105	
17	Gemma Hill	407 A13		80	Hogup Ridge North	809 A18		143	Ferry Peak	1202 009A		206	Stockton	1916 106	
18	Rosette	408 A14		81	Gumison Island SW	810 A19		144	Yettliff Peak	1203 010		207	Low Peak	1517 E38	
19	Park Valley	409 A15		82	Gumison Island SW	811 B41		145	Bonnevillie Race-track	1204 011		208	Utah Peak	1517 E39	
20	Black Butte	410 A16		83	Gumison Island	812 B42		146	Floating Island SE	1205 011		209	Utah Peak	1602 041a	
21	Kallon Pass SE	411 B09		84	Roze Point SW	813 B43		147	Floating Island SE	1206 012		210	Elephant Knoll SE	1604 042	
22	Monument Peak SW	412 B10		85	Indian Cove	814 B44		148	Knoles 2 SW	1207 013		211	Elephant Knoll SE	1605 044	
23	Monument Peak SE	413 B11		86	Pikes Point	815 B45		149	Knoles 2 SE	1208 014		212	Sold Hill 1 SE	1606 044	
24	Salt Wells	414 B12		87	Willard Spur	816 B46		150	Grayback Hills	1209 015		213	Sold Hill 1 SE	1607 045	
25	Salt Pass	415 B13		88	Plain City SW	817 B47		151	Ripole Valley	1210 016		214	Wichit Mountain SE	1608 046	
26	Blind Springs	416 B14		89	Plain City	818 B48		152	Low	1211 017		215	Wig Mountain	1609 048	
27	Dash Creek	502 A17A		90	Patterson Pass	902 A48a		153	Delle	1212 018		216	Wig Mountain	1610 048	
28	Grouse Creek	503 A17		91	Crater Island NW	903 A49		154	Poverty Point	1213 011		217	Tabby's Peak SW	1811 E41	
29	Inglum Canyon	504 A18		92	Lemy Island	904 A50		155	Corral Canyon	1214 012		218	Tabby's Peak SE	1812 E42	
30	Potters Creek	505 A19		93	Lucin 4 W	905 A51		156	Plug Peak SE	1215 014		219	Terra	1813 E43	
31	New Spring Hills	506 A20		94	Lucin 4 E	906 A52		157	Plug Peak	1216 015		220	Johnson Pass	1814 E44	
32	Rumack Knoll	507 A21		95	Winers Basin	907 A53		158	Antelope Island	1217 015		221	Saint John	1815 E45	
33	Russian Flats	508 A22		96	Deart Peak	908 A54		159	Saltair	1218 016		222	Ophir	1816 E46	
34	Procodile Mountain	510 A24		97	Round Mountain NW	909 A55		160	Mendover	1302 017a		223	Mercur	1817 E47	
35	Locomotive Springs	511 B17		98	Round Mountain SW	910 A56		161	Shibber	1303 017		224	Farber Peak	1702 049a	
36	Monument Point	512 B18		99	Hogup Ridge South	911 B49		162	Salduro	1304 018		225	Ochre Mountain	1703 049	
37	Lake Ridge	513 B19		100	Stongs Knob	912 B50		163	Arinosa	1305 019		226	Gold Hill	1704 050	
38	Sunset Pass	514 B20		101	Lakalake	913 B51		164	Arinosa NE	1306 021		227	Sold Hill 4 NE	1705 051	
39	Thatcher Mountain	515 B21		102	Carrington Island NW	914 B52		165	Barro	1307 022		228	Sold Hill 4 NE	1706 052	
40	Bairy Valley	602 A25a		103	Freemont Point	915 B53		166	Knolls	1308 023		229	Granite Peak NW	1707 053	
41	Tom's Cabin Spring	603 A26		104	Open Bay	916 B54		167	Aragonite W	1309 024		230	Topaz Mountain West	2109 122	
42	Rocky Pass Peak	604 A27		105	Pilot Peak	1002 A57A		168	Hatting Pass	1310 024		231	Topaz Mountain East	2110 124	
43	Waggon Pass	605 A27		106	Crater Island	1004 A58		169	Hatting Pass NE	1311 017		232	Topaz Mountain East	2111 127	
44	Prohibition Spring	606 A28		107	Lucin 4 SW	1005 A59		170	Flux	1312 018		233	Picture Rock Hills	2111 127	
45	Red Dome	607 A29		108	Lucin 4 SE	1006 A60		171	Burmaster	1313 017		234	Loopers Spring	2111 127	
46	McMillin	608 A30		109	Big Pass	1007 A61		172	Wills Junction	1314 020		235	Front Creek SW	2111 127	
47	Hogup Bar	609 A31		110	Kellar Well	1008 A62		173	Farmworth Peak	1315 022		236	Front Creek SW	2111 127	
48	Spring Bay SW	611 B25		111	Bound Mountain SW	1009 A63		174	Mendover SE	1402 025a		237	Front Creek SW	2111 127	
49	Coyle Point	612 B26		112	Bound Mountain	1010 A64		175	Salduro SW	1403 025b		238	Front Creek SW	2111 127	
50	Acorn	613 B27		113	Sally Mountain	1011 B27		176	Arinosa SE	1404 026		239	Front Creek SW	2111 127	
51	Golden Spike	614 B28		114	Beardens Knoll	1012 B28		177	Arinosa SE	1405 027		240	Front Creek SW	2111 127	
52	Thatcher Mtn SW	615 B29		115	Carrington Island SW	1013 B29		178	Arinosa SE	1406 028		241	Front Creek SW	2111 127	
53	Public Shooting	616 B30		116	Freemont Island SW	1014 B30		179	Knolls SW	1407 029		242	Front Creek SW	2111 127	
54	Jackson Spring	702 A33a		117	Huffalo Point	1015 B31		180	Knolls SE	1408 030		243	Front Creek SW	2111 127	
55	Lucin NW	703 A34		118	Antelope Island	1016 B32		181	Aragonite SW	1409 031		244	Front Creek SW	2111 127	
56	Lucin NE	704 A34		119	Clearfield	1017 B33		182	Aragonite SE	1410 032		245	Front Creek SW	2111 127	
57	Terrace Mountain	705 A35		120	Winers Canyon	1018 B34		183	Hatting Pass SE	1411 033		246	Front Creek SW	2111 127	
58	Terrace Mountain	706 A36		121	Winers Canyon	1019 B35		184	North Willow Canyon	1412 026		247	Front Creek SW	2111 127	
59	Terrace Mountain	707 A37		122	Winers Canyon	1020 B36		185	Frontville	1413 027		248	Front Creek SW	2111 127	
60	Terrace Mountain	708 A38		123	Winers Canyon	1021 B37		186	Frontville	1414 028		249	Front Creek SW	2111 127	
61	Terrace Mountain	709 A39		124	Winers Canyon	1022 B38		187	Frontville	1415 029		250	Front Creek SW	2111 127	
62	Terrace Mountain	710 A40		125	Winers Canyon	1023 B39		188	Frontville	1416 030		251	Front Creek SW	2111 127	
63	Terrace Mountain	711 A41		126	Winers Canyon	1024 B40		189	Frontville	1417 031		252	Front Creek SW	2111 127	

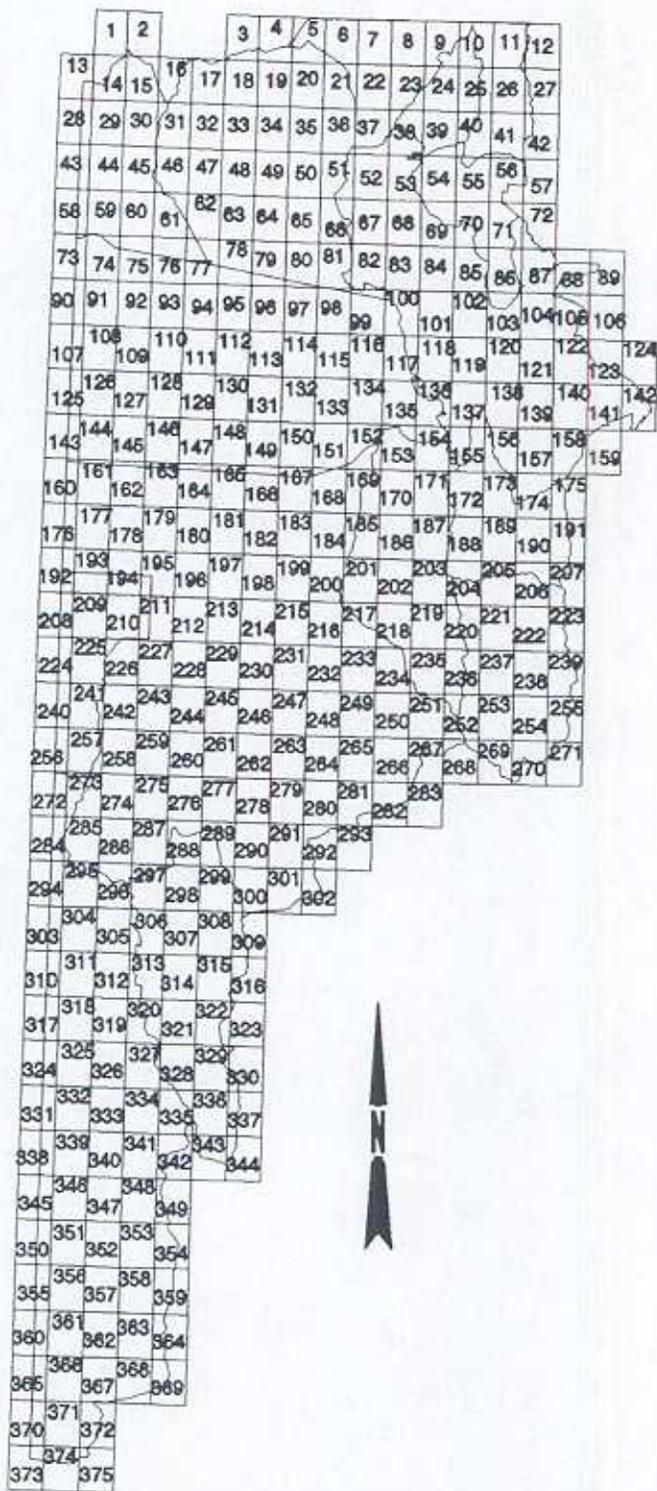


Figure 3. Great Salt Lake Desert Study Unit with hydrologic study area boundaries overlaid by a template showing 7-1/2 minute USGS quadrangle maps.

OPERATIONS USED IN LAND USE DATA ACQUISITION

Aerial Photography

Aerial photography of the study unit was conducted from June to August 1989. Mapping & Analytical Photographic Services Inc., Salt Lake City, Utah, photographed the study area using a turbo-charged Cessna TU-206 aircraft specially modified for aerial photography. An ARNAV R-40 Loran C navigation system kept the plane on line, while a Nikon F-3 35mm camera with 24mm lens in the photo well took the photos. All slides were taken on 35mm Ektachrome film and processed by Kodak labs. Slides were identified according to flight line number, cross-referenced on a special location map, and delivered to the division at different times between June and August 1989. The actual flight date was written on each slide frame by the division. Approximately 500 slides were delivered to the division covering the water-related land use in the study unit. These slides may be viewed at, or copies purchased from, the offices of the Division of Water Resources, Planning Section, 1636 West North Temple, Salt Lake City, Utah.

Field Mapping and Checking

Transferring information from 35mm slides to the field maps was accomplished between June and August, 1989. Slide cataloging, filing and mapping were done concurrently. Field checking and mapping was completed between July 10, and September 1, 1989. This process involved six people from the Division of Water Resources and one from the U.S. Geological Survey.

Digitizing and Processing

The data resulting from digitizing the field maps was processed through the Utah State Automated Geographic Reference Center (AGRC) during the fall and winter of 1989-90. The Great Salt Lake Desert Study Unit data are maintained at both the AGRC and the Division of Water Resources. Maps and data can be obtained from the AGRC at the Office of Planning and Budget, State Office Building, Salt Lake City, Utah.

A draft map of the cropland cover types was printed for each 7-1/2 min. quad. map for the purpose of checking the data. Each map was laid over the corresponding field map on a light table, and the cropland types and boundaries were double-checked for accuracy. Any corrections or additions were marked in red on the draft map for future updating. The corrected maps were updated and stored on the AGRC system.

GREAT SALT LAKE DESERT STUDY UNIT LAND USE DATA

The list of cover types and codes used in the 1989 Water Related Land Use Inventory for the Great Salt Lake Desert Study Unit is shown in Table 1. This list was standardized in 1988 and is further discussed in the land use categories of this report. Figure 4 shows the general location of the water-related land use areas mapped in the Great Salt Lake Desert Study Unit. Figures 5-19 show the water-related land use for each hydrologic subarea. The explanation opposite each of these figures shows the land cover categories and the number of acres of land in each category.

Division policy is to publish its land use data in these types of reports. Detailed maps will not be included. With the establishment of the AGRC for the state of Utah, the division policy is to supply the land use data to them for further distribution. Detailed maps can be obtained from the AGRC.

Table 1. List of cover types and codes used in the 1989 Water-Related Land Use Inventory for the Great Salt Lake Desert Study Unit.

Code	Cover Type	Comments/Explanations
I	Cropland	(Rotation Crops)
IA	Irrigated Cropland	
IA1	Horticulture & Specialty Crops	
IA1a	Fruit	(Orchards)
IA1a1	Cherry	
IA1a2	Apple	
IA1a3	Peach	
IA1a4	Pear	
IA1a5	Apricot	
IA1a6	Other	
IA1b	Nuts	(Groves)
IA1b1	Walnut	
IA1b2	Pecan	
IA1b3	Other	
IA1c	Vineyard	(Grapes)
IA1d	Bush Fruit	
IA1e	Berries	
IA1f	Other Horticulture	(Nurseries)
IA1g	Other Specialty Crops	
IA2	Row and Close Grown Crops	
IA2a	Grain	
IA2a1	Corn	
IA2a2	Sorghum	
IA2a3	Wheat	
IA2a4	Barley	
IA2a5	Oats	
IA2a6	Other Grains	
IA2b	Vegetables	
IA2b1	Potatoes	
IA2b2	Onions	
IA2b3	Beans	
IA2b4	Tomatoes	
IA2b5	Sweet Corn	
IA2b6	Other	(Melons, Squash, Etc.)

Table 1. Continued.

Code	Cover Type	Comments/Explanations
IA3	Forage Crops	
IA3a	Alfalfa	
IA3b	Grass Hay	
IA3c	Grass/Turf	
IA3d	Pasture	(Turf Farms)
IA3e	Other	
IA4	Other	
IA4a	Fallow	(Plowed or disked.)
IA4b	Idle	(Overgrown more than one season.)
IB	Non-Irrigated Cropland	(Rotation Crops)
IB1	Row and Close-Grown Crops	
IB1a	Grain, Beans, Seeds	
IB1a1	Wheat	
IB1a2	Other Grains	(Barley, Etc.)
IB1a3	Dry Beans	
IB1a4	Safflower	
IB1a5	Other	
IB2	Hayland Crops	
IB2a	Alfalfa	
IB2b	Pasture	
IB2c	Other	
IB3	Other	
IB3a	Fallow	(Plowed, Stubble, Mulch)
IB3b	Idle	(Overgrown more than one season.)
II	Grassy/Phreato./Open Water Areas	
IIA	Grassy Aspect	
IIA2a	Irrigated	
IIA2a1	Pasture	(Subject to spring flooding.)
IIA2a2	Hayland	(Subject to spring flooding.)
IIA2b	Non-Irrigated	
IIA2b1	Pasture	(Receives subsurface water.)
IIA2b2	Hayland	(Receives subsurface water.)
IIA2c	Non-Agricultural Use	(Receives subsurface water.)
IIB	Cattail/Bulrush Aspect	

Table 1. Continued.

Code	Cover Type	Comments/Recommendations
IIC	Wet Flats	(Mud flats w/little or no vgttn.)
IID	Shrub Aspect	(Salt Brush, Sagebrush)
IIE	Riparian	
IIE1	Forested Aspect	(Cottonwoods, Birch)
IIE2	Shrub Aspect	(Willows)
IIF	Open Water	
IIF1	Streams	
IIF2	Reservoirs	(Man-Made)
IIF3	Ponds & Lakes	
IIF4	Other	
IIF4a	Temporary Flooded	
IIF4b	Sewage Lagoon	
IIF4c	Evaporation Pond	
IIF5	Salt Water	(Salt/Salty Lakes)
III	Range Land and Forest Land	
IIIA	Alpine Plant Communities	
IIIB	Conifer	
IIIB1	Douglas Fir - White Fir	
IIIB2	Ponderosa Pine	
IIIB3	Fir - Spruce	
IIIB4	Lodgepole Pine	
IIIB5	Pinion Pine - Juniper	
IIIB6	Other	
IIIC	Deciduous	
IIIC1	Aspen	
IIIC2	Mountain Brush	(Oak Brush, Maples, Chaparral)
IIIC3	Other	
IIID	Grass Aspect	
IIID1	Dry Pastures - Improved	(Chained and reseeded)
IIID2	Native Grasses	
IIID3	Other	(Forbs)
IIIE	Shrub Aspect	
IIIE1	Northern Desert Shrub	
IIIE1a	Sagebrush	(Shadscale, Greasewood, Halogeton)

Table 1. Continued.

Code	Cover Type	Comments/Explanations
IIIE1b	Other	
IIIE2	Southern Desert Shrubs	
IIIE2a	Creosote Bush	
IIIE2b	Other	(Forbs, Annual Grasses)
IIIE3	Salt Desert Shrubs	
IIIE3a	Shascale	
IIIE3b	Greasewood	
IIIE3c	Saltbrush	
IIIE3d	Desert Molley	
IIIE3e	Other	(Halogeton)
IV	Barren Lands	
IVA	Bare Soil/Sand	
IVA1	Dry Salt Flats	
IVA2	Beaches	
IVA3	Sandy Areas Other Than Beaches	(Desert Sand Dunes)
IVA4	Other	
IVB	Rock Outcrops	
IVC	Excavated Lands	(Strip Mines, Quarries, Gravel Pits)
IVD	Other	
V	Built-Up Land	
VA	Farmsteads	
VA1	Buildings/Homes	
VA2	Open Spaces	(Feed Lots, Etc.)
VB	Residential	
VB1	Buildings/Homes	(High Density)
VB2	Buildings/Homes	(Low Density)
VB3	Open Spaces	(Parks, Golf Courses)
VB4	Idle Spaces	(Not Irrigated)
VC	Commercial/Industrial	
VC1	Commercial	
VC2	Industrial	
VC3	Open Spaces	
VD	Transportation, Communications, Utilities	
VE	Other	

Land Cover Area Summary for Figure 4.
Great Salt Lake Desert Study Unit.

State Code	Cover Type	Acres
IA1a	Fruit	18.91
IA2a	Grain	12,077.74
IA2a1	Corn	418.10
IA2a2	Sorghum	28.63
IA2b1	Potatoes	4.15
IA3a	Alfalfa	29,504.50
IA3b	Grass Hay	3,920.92
IA3C	Grass/Turf	74.60
IA3d	Pasture	19,364.52
IA4a	Fallow	3,413.99
IA4b	Idle	11,206.08
IB1	Row/Close Grown Crop (dry)	58.57 ¹
IB1a	Grain/Beans/Seeds (dry)	33,948.47 ¹
IB1a4	Safflower (dry)	583.37 ¹
IB2a	Alfalfa (dry)	3,379.80 ¹
IB2b	Pasture (dry)	8,450.64 ¹
IB3a	Fallow (dry)	31,911.27 ¹
IB3b	Idle (dry)	42,707.47 ¹
IIA1a	Pasture (surf. & sub irr.)	7,586.51
IIA1b	Hayland (surf. & sub irr.)	408.15
IIA2a	Pasture (sub-irr.)	465.81
IIB	Cattail/Bulrush Asp.	6,701.03
IIB-E	Wet/Vegetation Asp.	55,357.15
IIC	Wet Flats	44,397.21 ²
IIE	Riparian	1,224.54
IIF	Open Water	7,208.32
IIF2	Reservoirs	4,986.71
IIF4a	Temporary Flooded	107.95
IIF4b	Sewage Lagoon	49.27
IIF4c	Evaporation Ponds	41,692.78 ³
IIF5	Salt Water	1,434,131.82 ⁴
IVC	Excavated Lands	403.34
VA1	Farmsteads	1,031.95
VA2	Open Spaces (rural)	1,139.40
VB1	Bldgs/Homes (hi den)	2,417.92
VB2	Bldgs/Homes (lo den)	2,680.65
VB3	Open Spaces	333.27
VB4	Idle Spaces	480.37
VC	Commercial/Industr.	11.40
VC1	Commercial	163.16
VC2	Industrial	2,402.20
VC3	M&I Open Spaces	2,420.71
Total Water-Related Land Use		1,818,873.53
R	All Other Land	9,703,120.07
Total Land In GSL Desert Study Unit		11,521,993.60

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Non-irrigated agriculture lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

²In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

³Some evaporation ponds were not photographed with 35 mm slides. Data were obtained from LANDSAT imagery.

⁴The Salt Water category includes: the Great Salt Lake, Evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217').

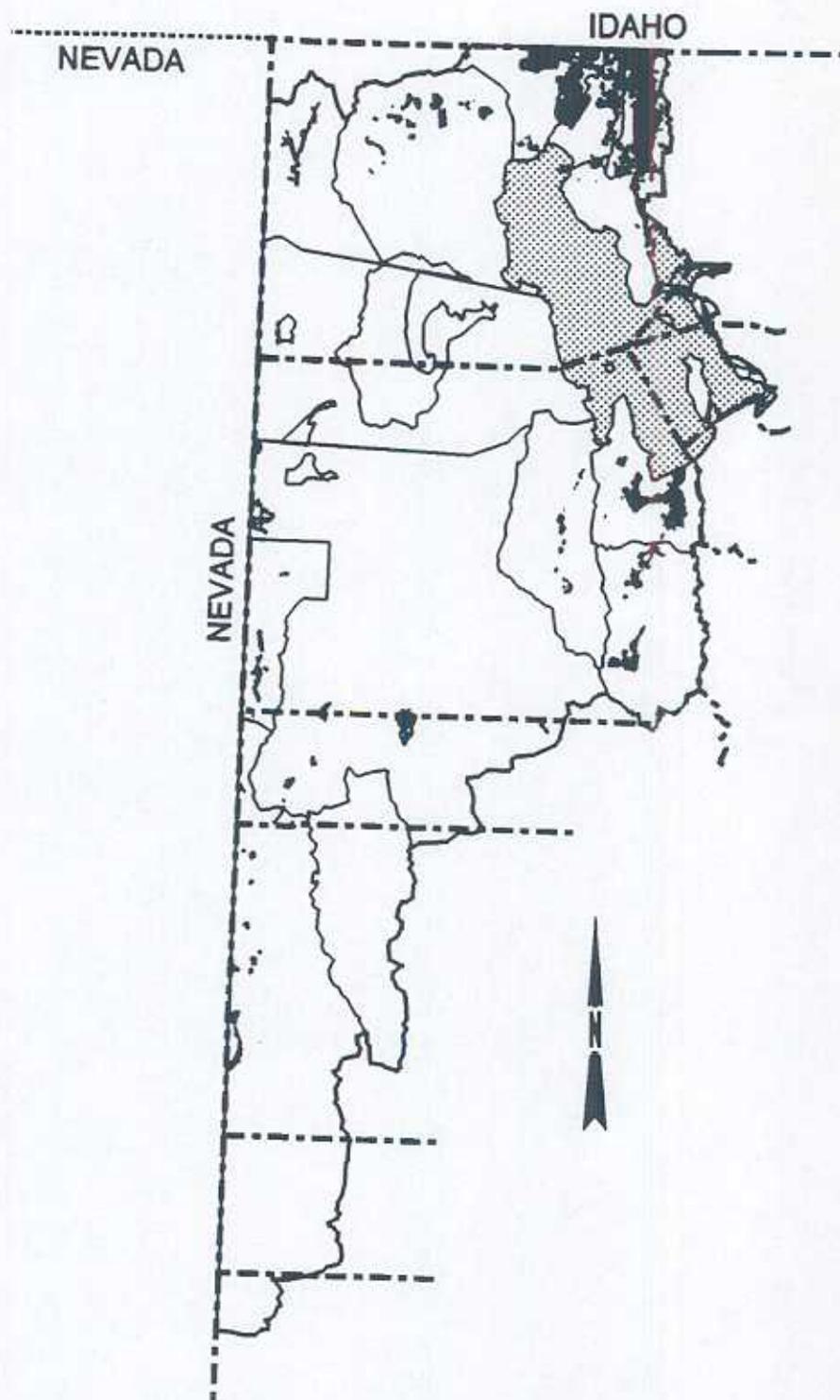


Figure 4. Water-related land use mapped areas for the Great Salt Lake Desert Study Unit with the Great Salt Lake highlighted.

Land Cover Area Summary for Figure 5.
Grouse Creek (01-01-001) subarea (Box Elder Co.).

Code	Land Cover	Acres
IA2a	Grain	228.86
IA3a	Alfalfa	2,109.83
IA3b	Grass Hay	458.53
IA3d	Pasture	1,305.71
IA4b	Idle	667.92
IB2b	Pasture (dry)	1,161.38 ¹
IB3b	Idle (dry)	129.28 ¹
IIB	Cattail/Bullrush Aspect	23.86
IIC	Wet Flats	50.63 ²
IIE	Riparian	115.52
IIF	Open Water	44.52
IIF5	Salt Water	18.60 ³
IVC	Excavated Lands	15.06
VA1	Farmsteads	34.71
VB2	Residential (low den)	78.01
Total Water-Related Land Use		6,442.42

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Non-irrigated agriculture lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

²In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

³The Salt Water category includes: the Great Salt Lake, Evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217').

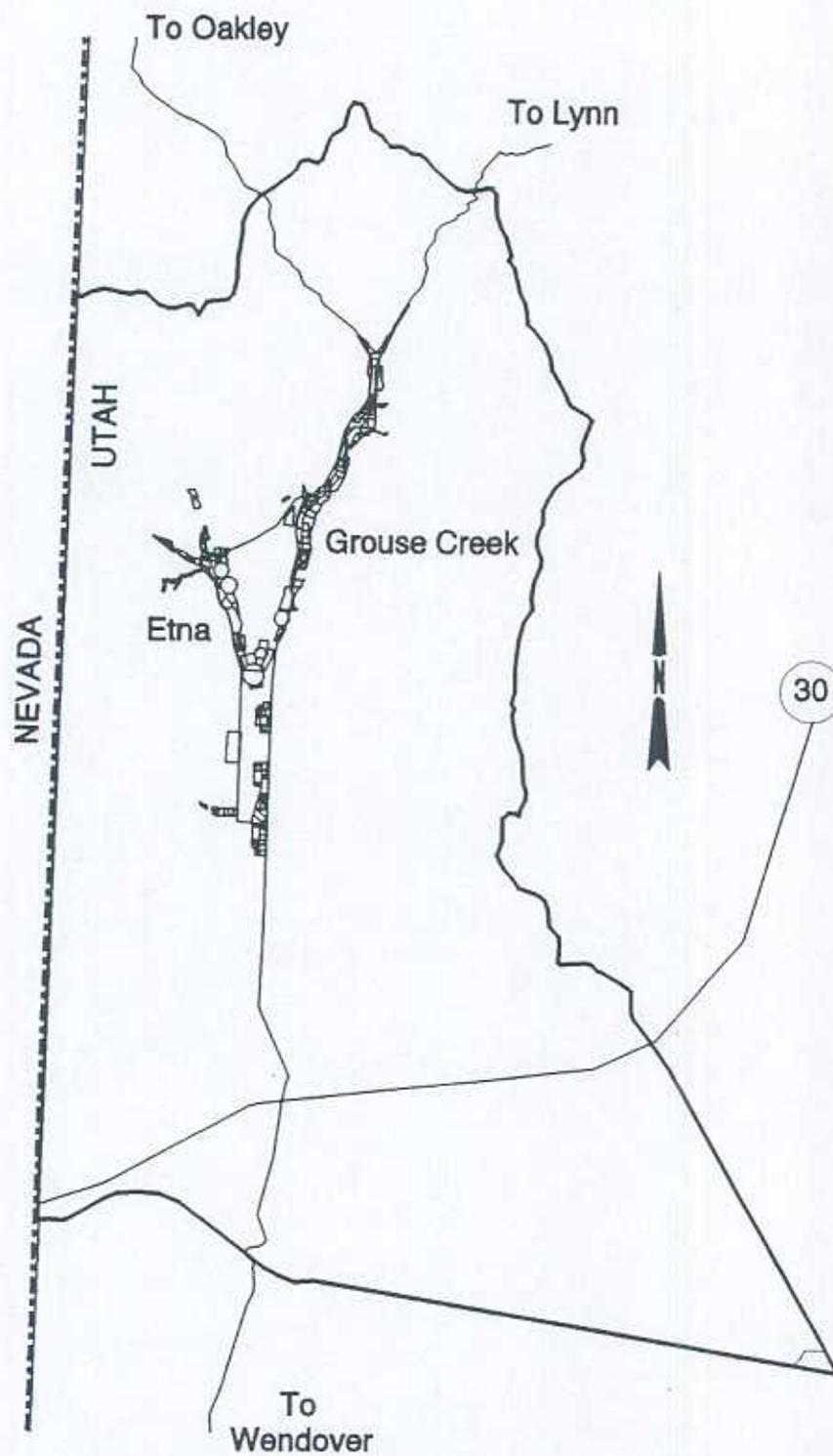


Figure 5. Water-related land use coverage of the Grouse Creek (01-01-001) subarea.

Land Cover Area Summary for Figure 6.
Park Valley (01-01-002) subarea (Box Elder Co.).

Code	Land Cover	Acres
IA2a	Grain	1,385.46
IA3a	Alfalfa	3,308.05
IA3b	Grass Hay	685.26
IA3d	Pasture	1,365.20
IA4a	Fallow	86.75
IA4b	Idle	1,213.34
IB1a	Grain/Beans/Seeds (dry)	164.69 ¹
IB2b	Pasture (dry)	751.15 ¹
IB3a	Fallow (dry)	853.50 ¹
IB3b	Idle (dry)	607.02 ¹
IIA1a	Pasture (surf & sub irr.)	237.01
IIA1b	Hayland (surf & sub irr.)	408.15
IIB	Cattail/Bulrush Asp.	482.57
IIC	Wet Flats	66.95 ²
IIF	Open Water	21.07
IIF5	Salt Water	25,037.75 ³
IVC	Excavated Lands	10.81
VA1	Farmsteads	56.35
VA2	Open Spaces (rural)	107.00
VB2	Blds/Homes (lo den)	31.10
Total Water-Related Land Use		36,879.18

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Non-irrigated agriculture lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are normally not mapped. Acres shown in the table reflect only the number of acres mapped, not the total number of acres in the subarea.

²In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

³The Salt Water category includes: the Great Salt Lake, Evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217').

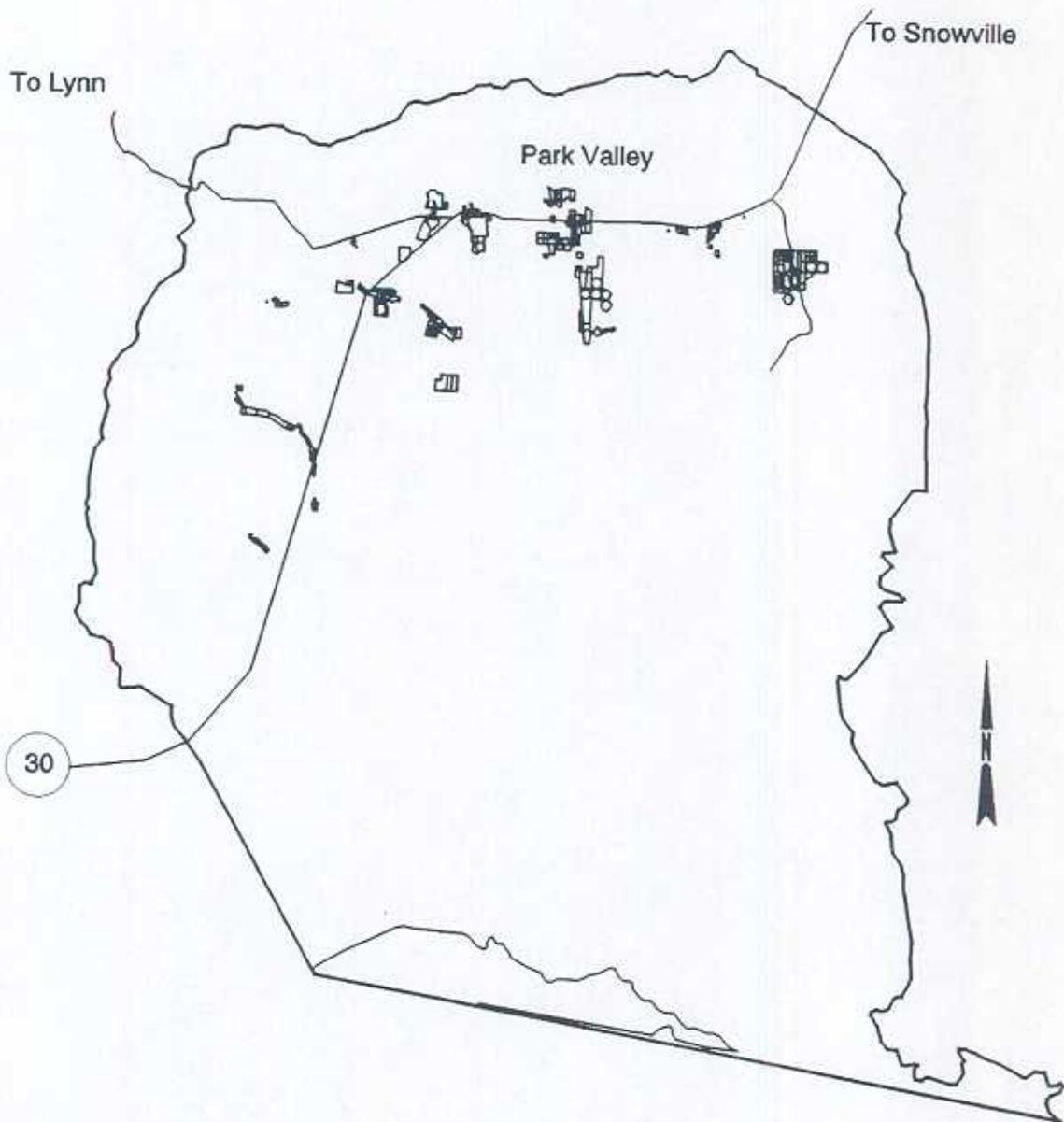


Figure 6. Water-related land use coverage of the Park Valley (01-01-002) subarea.

Land Cover Area Summary for Figure 7.
Curlew Valley (01-01-003) subarea (Box Elder Co.).

Code	Land Cover	Acres
IA2a	Grain	5,227.26
IA3a	Alfalfa	10,220.04
IA3b	Grass Hay	246.38
IA3d	Pasture	340.42
IA4a	Fallow	772.27
IA4b	Idle	4,065.36
IB1a	Grain/Beans/Seeds (dry)	3,146.74 ¹
IB2a	Alfalfa (dry)	173.72 ¹
IB2b	Pasture (dry)	377.48 ¹
IB3a	Fallow (dry)	5,233.69 ¹
IB3b	Idle (dry)	16,120.40 ¹
IIA1a	Pasture (surf & sub)	197.33
IIE	Riparian	96.60
IIF	Open Water	1,231.35
IVC	Excavated Lands	75.41
VA1	Farmsteads	6.46
VA2	Open Spaces (rural)	320.79
VB2	Residential (lo den)	93.35
VB3	Open Spaces	3.26
VC	Commercial/Industrial	5.68
VC1	Commercial	34.58
Total Water-Related Land Use		47,988.57

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Non-irrigated agriculture lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are normally not mapped. Acres shown in the table reflect only the number of acres mapped, not the total number of acres in the subarea.

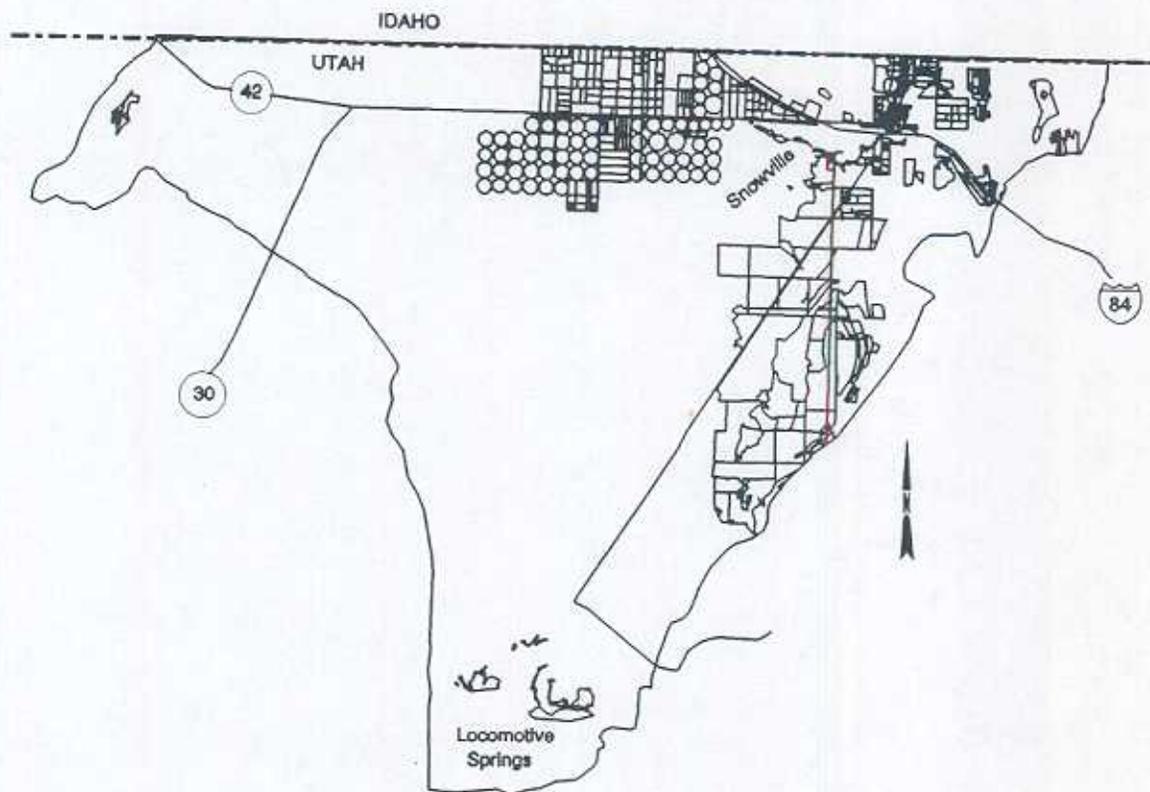


Figure 7. Water-related land use coverage of the Curlew Valley (01-01-003) subarea.

Land Cover Area Summary for Figure 8.
 North Great Salt Lake Desert (01-02-001) subarea.

Code	Land Cover	COUNTY		Total Acres
		Box Elder	Tooele	
IA2a1	Corn	15.71	0.00	15.71
IA3a	Alfalfa	221.59	0.00	221.59
IA3d	Pasture	236.36	0.00	236.36
IA4b	Idle	81.19	0.00	81.19
IIB-E	Wet/Vegetation Asp.	9,570.28	0.00	9,570.28
II4Fc	Evaporation Pond	0.00	17,426.16	17,426.16 ¹
IIF5	Salt Water	206,533.20	137,543.03	344,076.23 ²
Total Water-Related Land Use		216,658.33	154,969.19	371,627.52

¹Some evaporation ponds were not photographed with 35 mm slides. Data were obtained from LANDSAT imagery.

²The Salt Water category includes: the Great Salt Lake, Evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217').

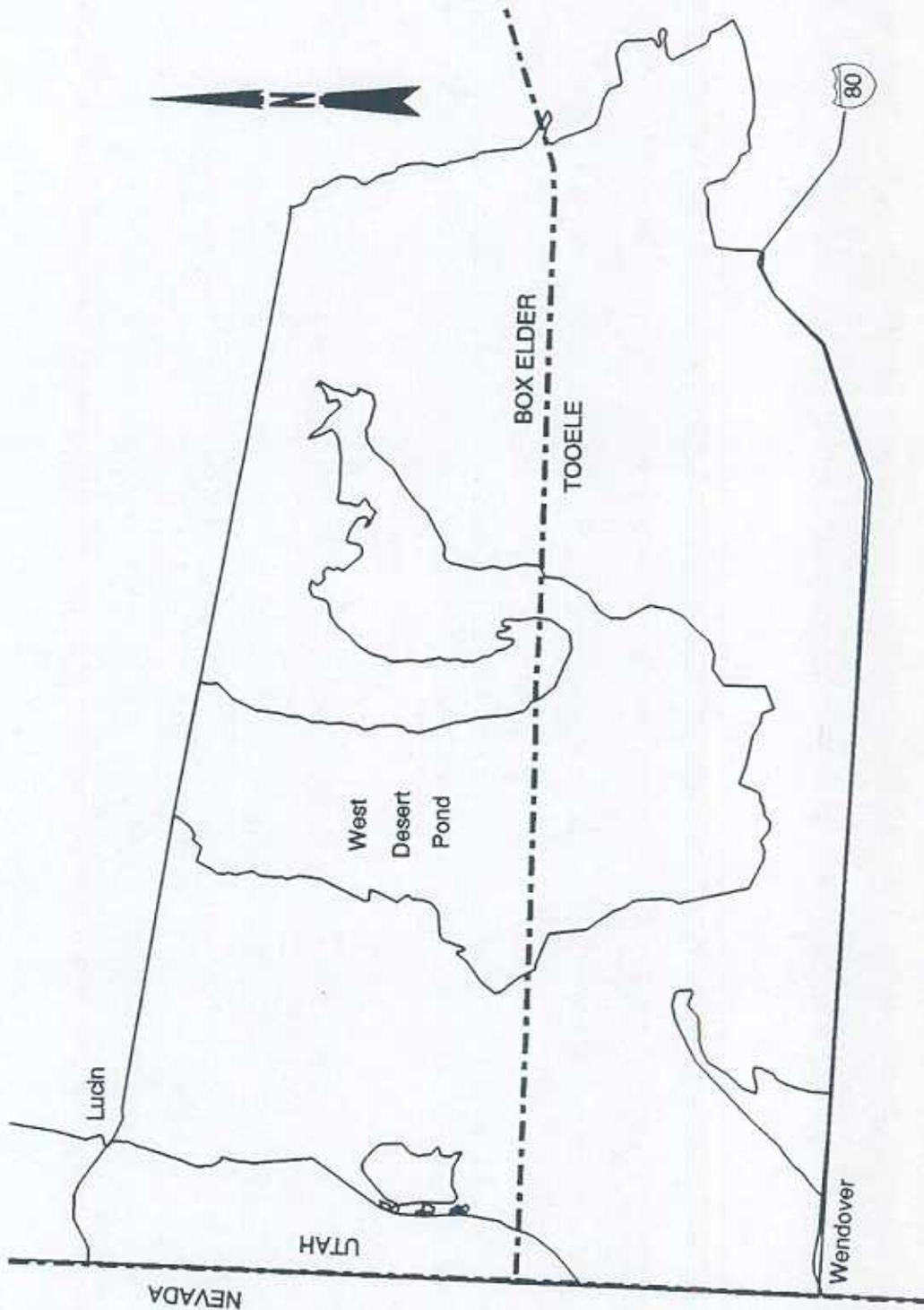


Figure 8. Water-related land use coverage of the North Great Salt Lake Desert (01-02-001) subarea.

Land Cover Area Summary for Figure 9.
South Great Salt Lake Desert (01-02-002) subarea.

Code	Land Cover	COUNTY		Total Acres
		Tooele	Juab	
IA2a1	Corn	0.00	35.86	35.86
IA3a	Alfalfa	0.00	546.18	546.18
IA3c	Grass Hay	156.62	760.47	917.09
IA3d	Pasture	41.88	395.09	436.97
IA4b	Idle	8.86	888.25	897.11
IB2b	Pasture (non irr)	56.00	468.36	524.36 ¹
IB3b	Idle (non irr)	0.00	51.53	888.25 ¹
IIA1a	Pasture (surf & sub irr)	501.65	13.08	514.73
IIA2a	Pasture (sub irr)	0.00	317.26	317.26
IIB	Cattail/Bullrush Aspect	351.67	5,306.90	5,658.57
IIC	Wet Flats	10,609.96	577.27	11,201.75 ²
IIE	Riparian	284.83	62.35	347.18
IIF	Open Water	106.31	1,745.18	1,851.49
IIF4b	Sewage Lagoon	41.16	0.00	41.16
IIF4c	Evaporation Pond	21,695.37	0.00	21,695.37
IVC	Excavated Lands	0.00	12.91	12.91
VA1	Farmsteads	0.00	110.95	110.95
VB1	Residential (hi den)	138.10	0.00	138.10
VB2	Residential (lo den)	8.60	18.95	27.55
VC2	Industrial	103.08	0.00	103.08
VC3	Open Space	1,292.88	0.00	1,292.88
Total Water-Related Land Use		35,396.97	11,310.59	46,707.56

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Non-irrigated agriculture lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are normally not mapped. Acres shown in the table reflect only the number of acres mapped, not the total number of acres in the subarea.

²In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

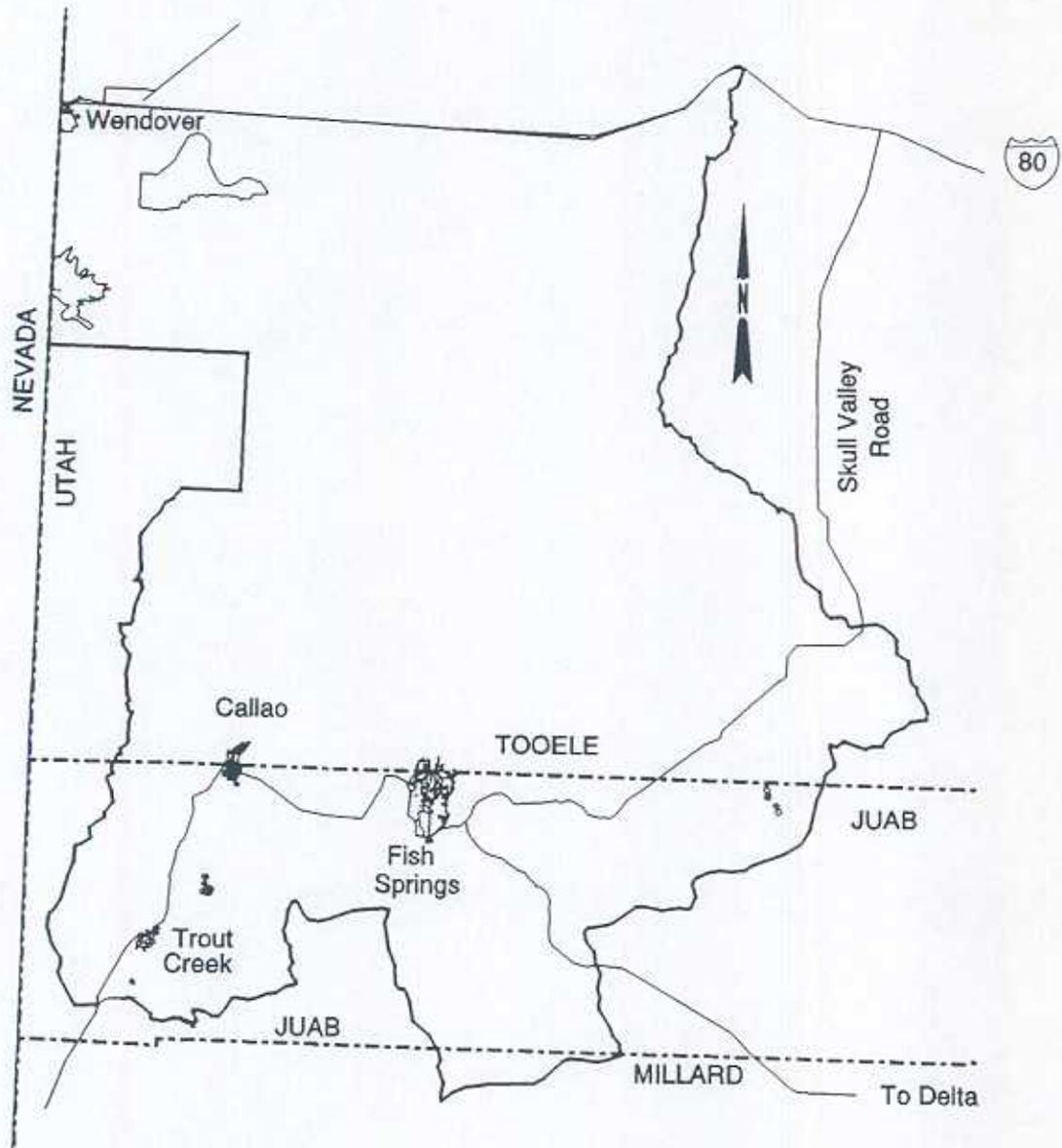


Figure 9. Water-related land use coverage of the South Great Salt Lake Desert (01-02-002) subarea.

Land Cover Area Summary for Figure 10.
 Deep Creek (01-03-003) subarea.

Code	Land Cover	COUNTY		Total Acres
		Tooele	Juab	
IA2a	Grain	23.01	0.00	23.01
IA3a	Alfalfa	246.19	6.85	253.04
IA3d	Pasture	3,940.03	28.27	3,968.30
IA4b	Idle	538.62	0.00	538.62
IB2b	Pasture (dry)	68.76	0.00	68.76 ¹
IIF	Open Water	1.50	0.00	1.50
VA1	Farmsteads	47.09	0.00	47.09
VA2	Open Spaces (rural)	38.23	0.00	38.23
VB2	Residential (lo den)	18.23	0.00	18.23
Total Water-related Land Use		4,921.66	35.12	4,956.78

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Non-irrigated agriculture lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are normally not mapped. Acres shown in the table reflect only the number of acres mapped, not the total number of acres in the subarea.

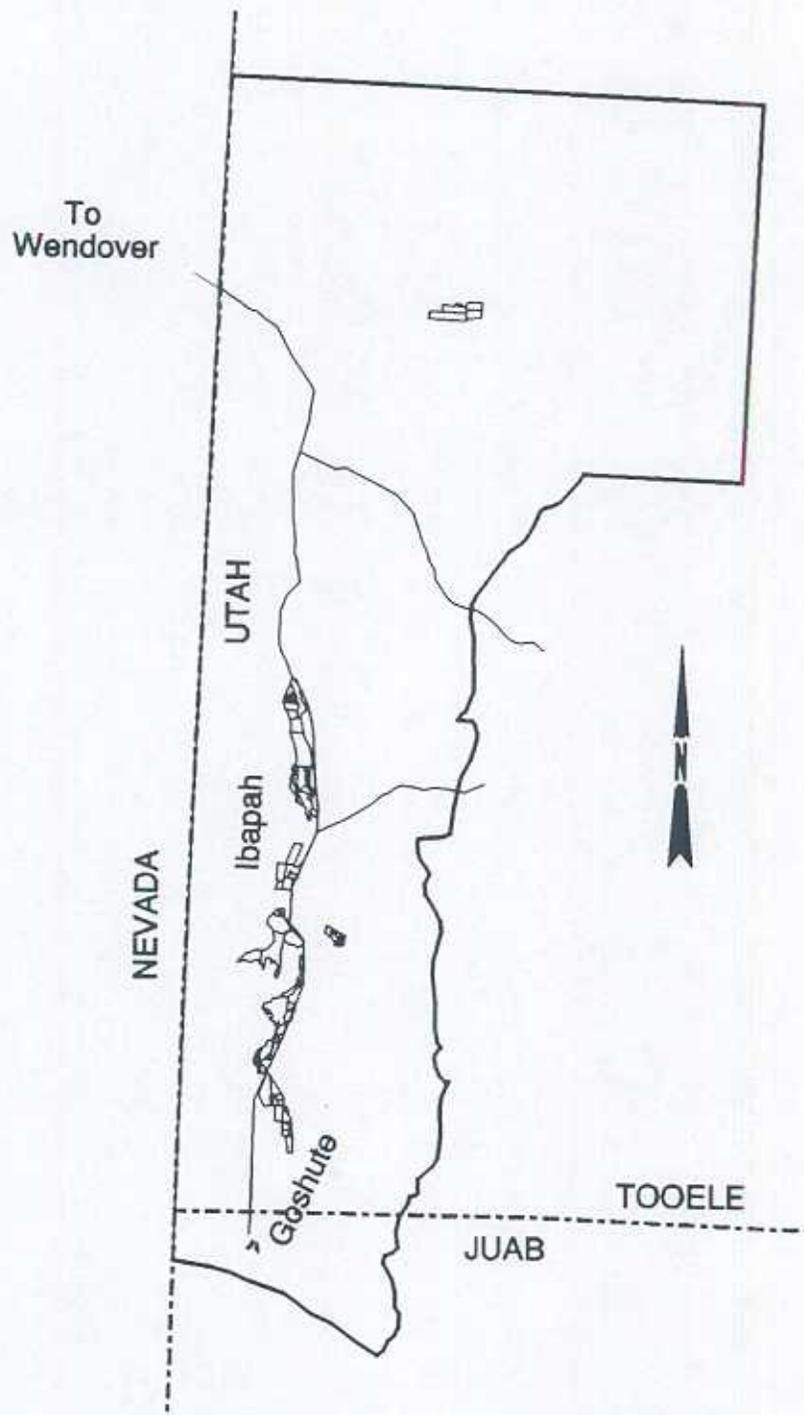


Figure 10. Water-related land use coverage of the Deep Creek (01-02-003) subarea.

Land Cover Area Summary for Figure 11.
Snake Valley (01-03-001) subarea.

Code	Land Cover	COUNTY		Total Acres
		Juab	Millard	
IA1a	Fruit	0.00	17.31	17.31
IA2a	Grain	0.00	512.68	512.68
IA2a1	Corn	0.00	12.92	12.92
IA3a	Alfalfa	0.00	2,578.31	2,578.31
IA3b	Grass Hay	0.00	22.20	22.20
IA3d	Pasture	209.35	2,323.54	2,532.89
IA4a	Fallow	0.00	36.30	36.30
IA4b	Idle	0.00	967.62	967.62
IIA1a	Pasture (surf & sub)	349.22	707.53	1,056.75
IIC	Wet Flats	12.89	0.00	12.89 ¹
IIE	Riparian	120.33	87.23	207.56
IIF	Open Water	0.00	272.30	272.30
VA1	Farmsteads	0.00	129.91	129.91
VA2	Open Spaces (rural)	0.00	113.08	113.08
VB2	Residential (lo den)	0.00	50.25	50.25
VC2	Industrial	0.00	12.77	12.77
Total Water-related Land Use		691.79	7,843.95	8,535.74

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

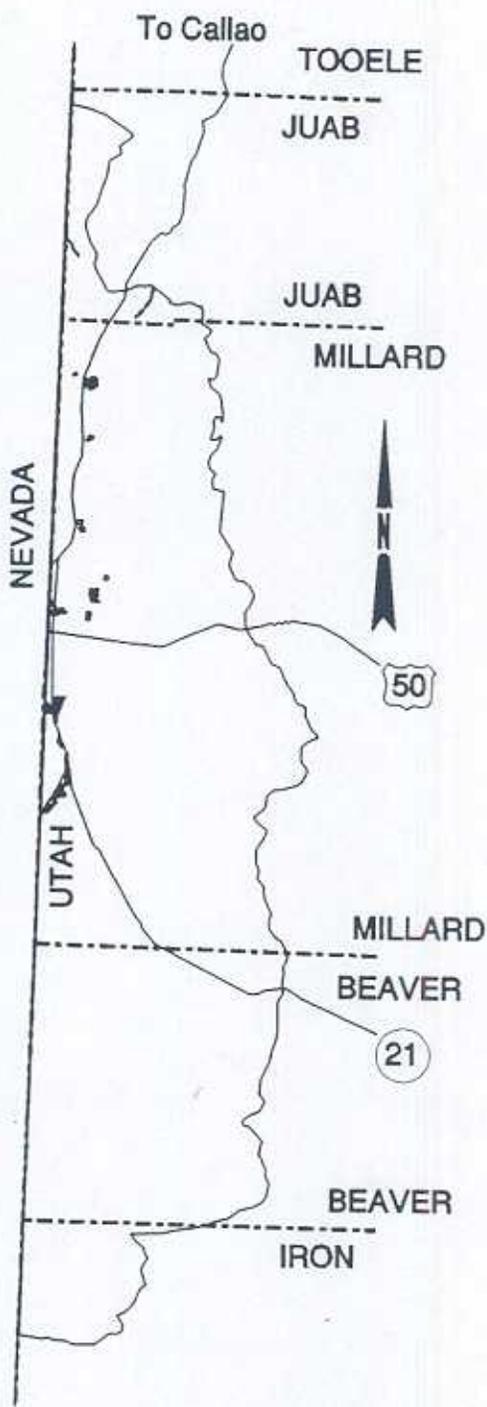


Figure 11. Water-related land use coverage of the Snake (01-03-001) subarea.

Land Cover Area Summary for Figure 12.
Tule Valley (01-03-002) subarea (Millard Co.).

Code	Land Cover	Acres
		<hr/> 0.00
	Total Water-related Land Use	<hr/> 0.00

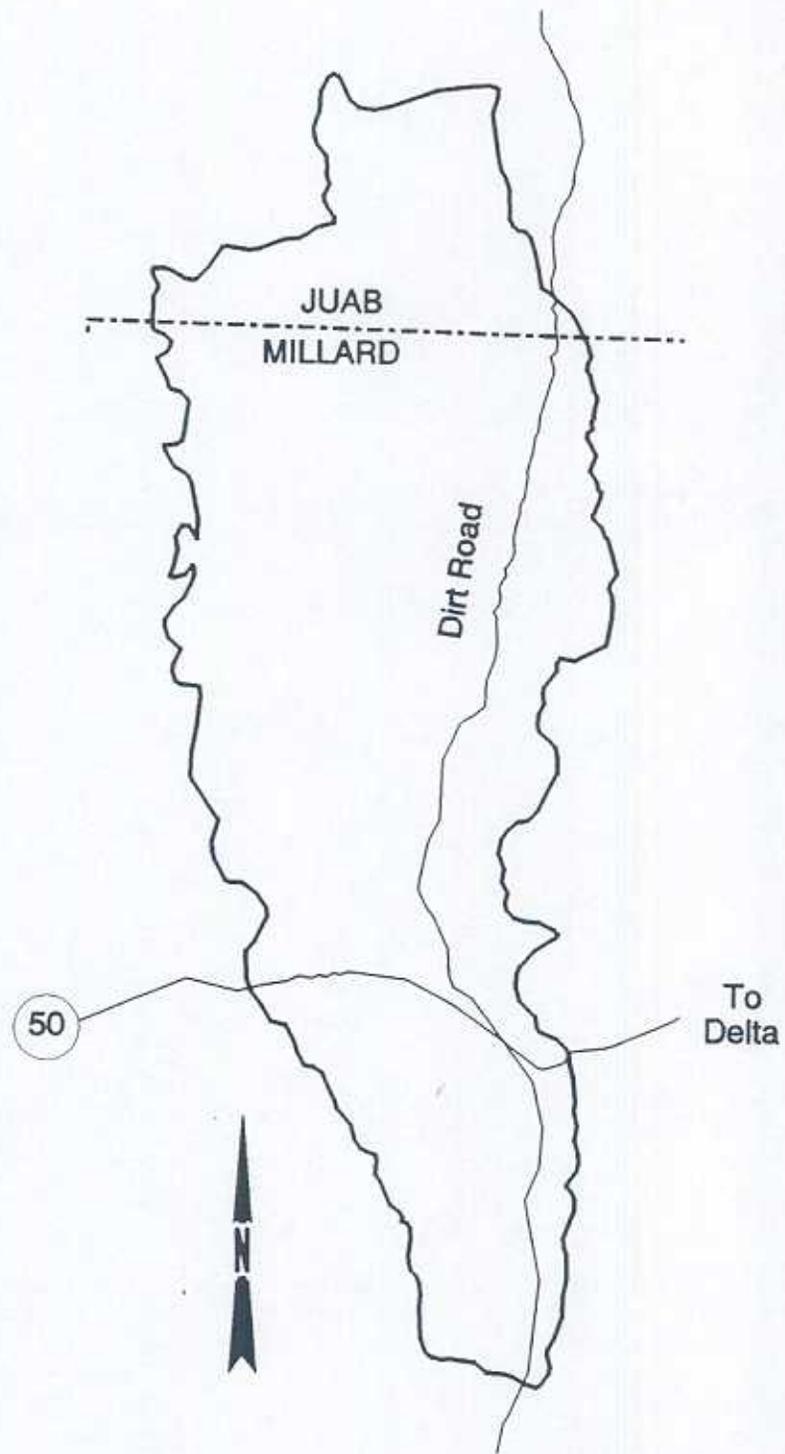


Figure 12. Water-related land use coverage of the Tule Valley (01-03-002) subarea.

Land Cover Area Summary for Figure 13.
 Skull Valley (01-04-001) subarea (Tooele Co.).

Code	Land Cover	Acres
IA2a	Grain	47.18
IA3a	Alfalfa	1,553.93
IA3b	Grass Hay	48.25
IA3d	Pasture	333.95
IA4b	Idle	136.73
IB2b	Pasture (Non Irr.)	583.94 ¹
IIA1a	Pasture (surf & sub)	176.57
IIF	Open Water	10.08
IVC	Excavated Lands	22.81
VA1	Farmsteads	6.79
VA2	Open Spaces (rural)	142.99
VB2	Residential (lo den)	14.45
VC2	Industrial	73.89
Total Water-related Land Use		<u>3,151.56</u>

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Non-irrigated agriculture lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are normally not mapped. Acres shown in the table reflect only the number of acres mapped, not the total number of acres in the subarea.

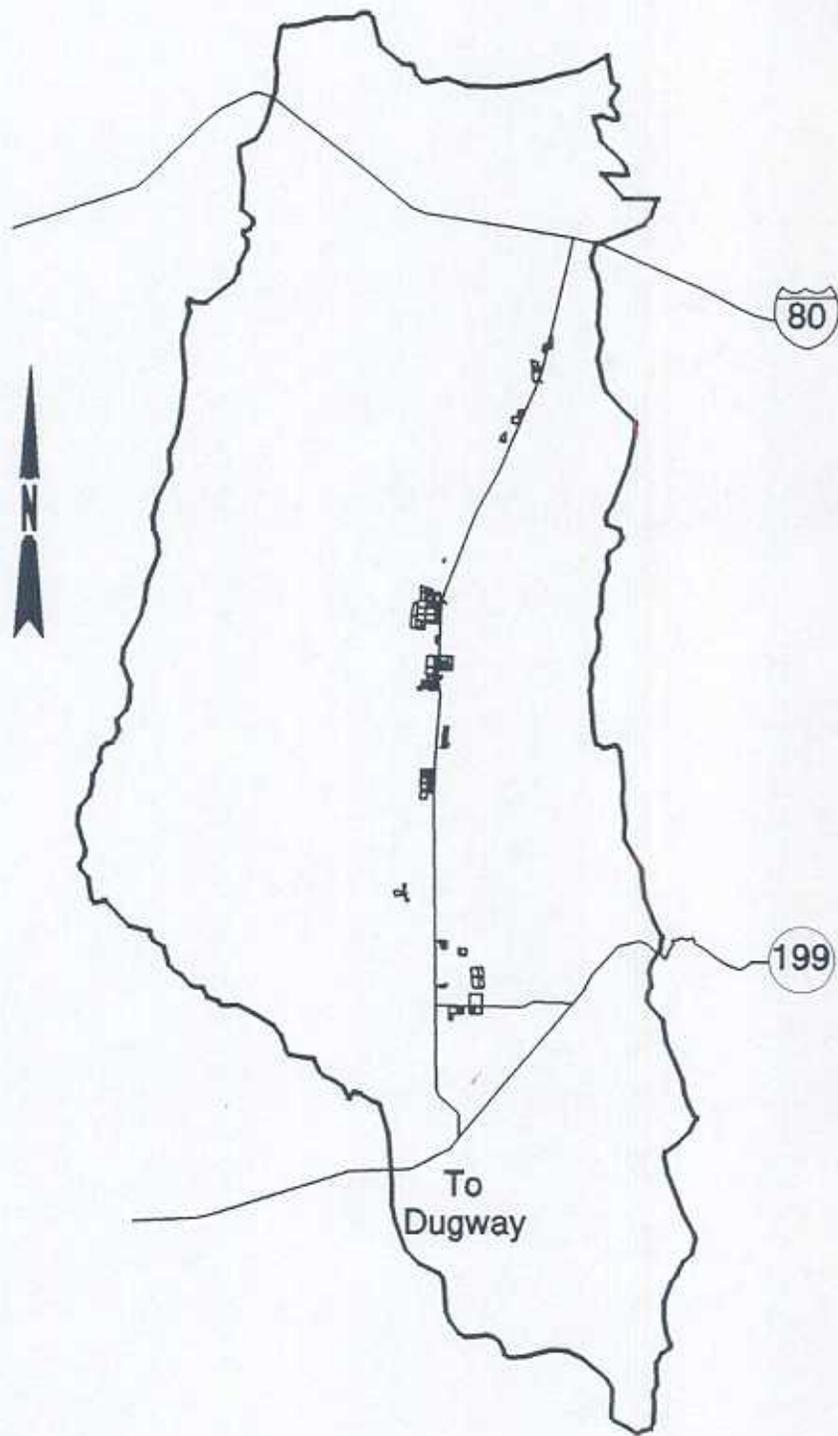


Figure 13. Water-related land use coverage of the Skull Valley (01-04-001) subarea.

Land Cover Area Summary for Figure 14.
 Rush Valley (01-05-001) subarea (Tooele Co.).

Code	Land Cover	Acres
IA2a	Grain	507.59
IA3a	Alfalfa	2,803.29
IA3b	Grass Hay	290.07
IA3c	Grass Turf	74.60
IA3d	Pasture	3,520.02
IA4a	Fallow	1,618.18
IA4b	Idle	1,115.12
IB2b	Pasture (Non Irr.)	1,152.39 ¹
IIA1a	Pasture (surf & Sub)	297.94
IIA2a	Pasture (sub-irr.)	72.20
IIE	Riparian	215.22
IIF	Open Water	2,721.92
IVC	Excavated Lands	12.03
VA1	Farmsteads	129.57
VA2	Open Spaces (rural)	27.25
VB2	Residential (lo den)	466.86
VB3	Open Spaces	7.19
VB4	Idle Spaces	7.20
VC1	Commercial	2.26
VC2	Industrial	27.48
VC3	Open Spaces	58.40
Total Water-related Land Use		15,126.78

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Non-irrigated agriculture lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are normally not mapped. Acres shown in the table reflect only the number of acres mapped, not the total number of acres in the subarea.

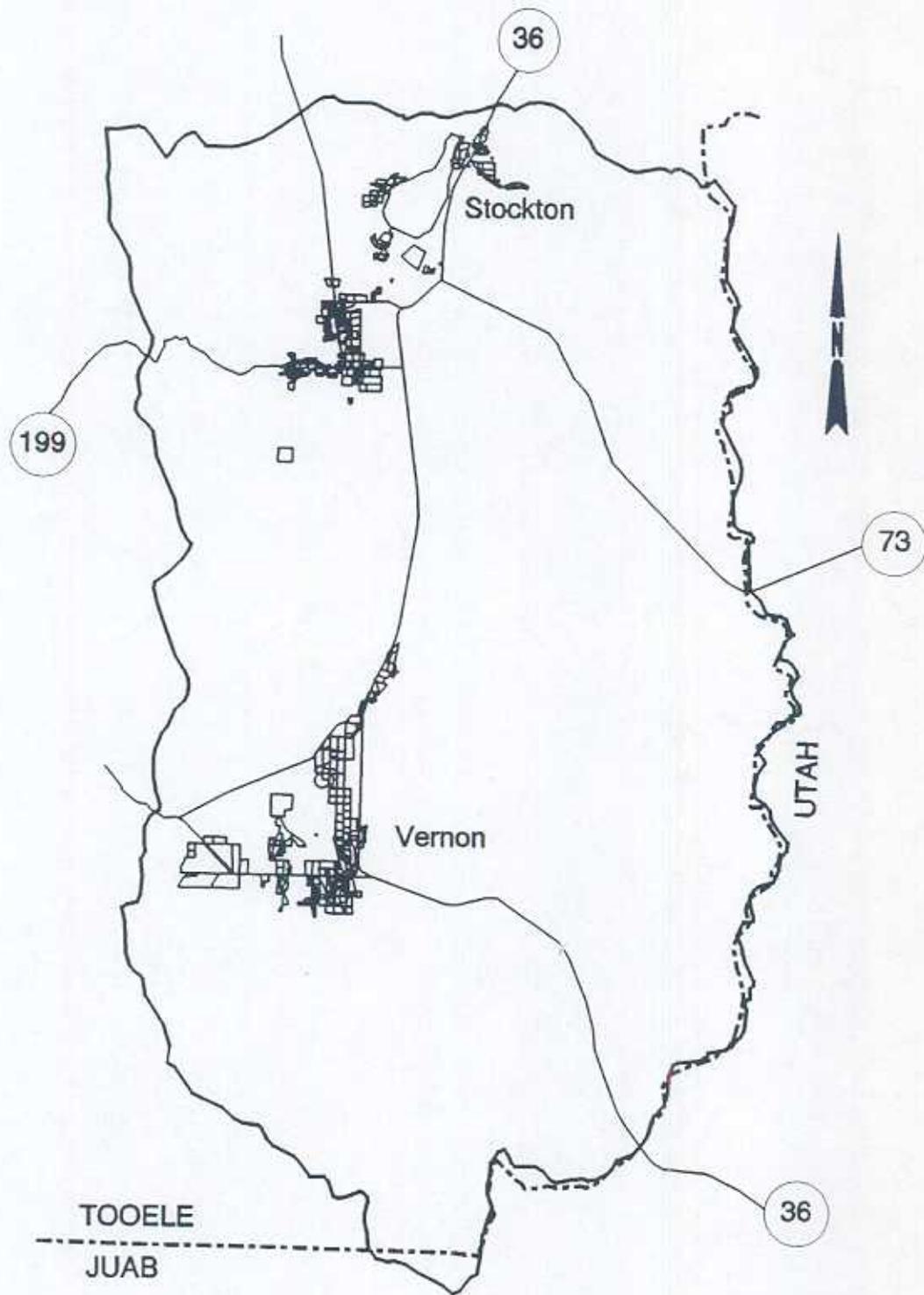


Figure 14. Water-related land use coverage of the Rush Valley (01-05-001) subarea.

Land Cover Area Summary for Figure 15.
Tooele Valley (01-05-002) subarea (Tooele Co).

Code	Land Cover	Acres
IA1a	Fruit	1.60
IA2a	Grain	2,793.16
IA2a1	Corn	353.61
IA2a2	Sorghum	28.63
IA2b1	Potatoes	4.15
IA3a	Alfalfa	4,667.04
IA3b	Grass Hay	1,020.15
IA3d	Pasture	4,669.23
IA4a	Fallow	777.11
IA4b	Idle	1,354.53
IB1a	Grain/Beans/Seeds (dry)	594.44 ¹
IB1a4	Safflower (dry)	30.20 ¹
IB2a	Alfalfa (dry)	819.26 ¹
IB2b	Pasture (dry)	933.78 ¹
IB3a	Fallow (dry)	960.41 ¹
IB3b	Idle (dry)	2,498.04 ¹
IIA1a	Pasture (surf & sub)	256.46
IIB	Cattail/Bullrush Asp.	11.51
IIC	Wet Flats	7.39 ²
IIE	Riparian	209.99
IIF	Open Water	378.43
IIF4a	Temporary Flooded	107.09
IIF4c	Evaporation Pond	2,572.05
IIF5	Salt Water	121.31 ³
IVC	Excavated Lands	206.24
VA1	Farmsteads	301.88
VA2	Open Spaces (rural)	190.90
VB1	Residential (hi den)	2,275.42
VB2	Residential (lo den)	1,814.30
VB3	Open Spaces	322.82
VB4	Idle Spaces	477.56
VC1	Commercial	126.32
VC2	Industrial	229.89
VC3	Open Spaces	101.10
Total Water-related Land Use		31,216.00

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Non-irrigated agriculture lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are normally not mapped. Acres shown in the table reflect only the number of acres mapped, not the total number of acres in the subarea.

²In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

³The Salt Water category includes: the Great Salt Lake, Evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217').

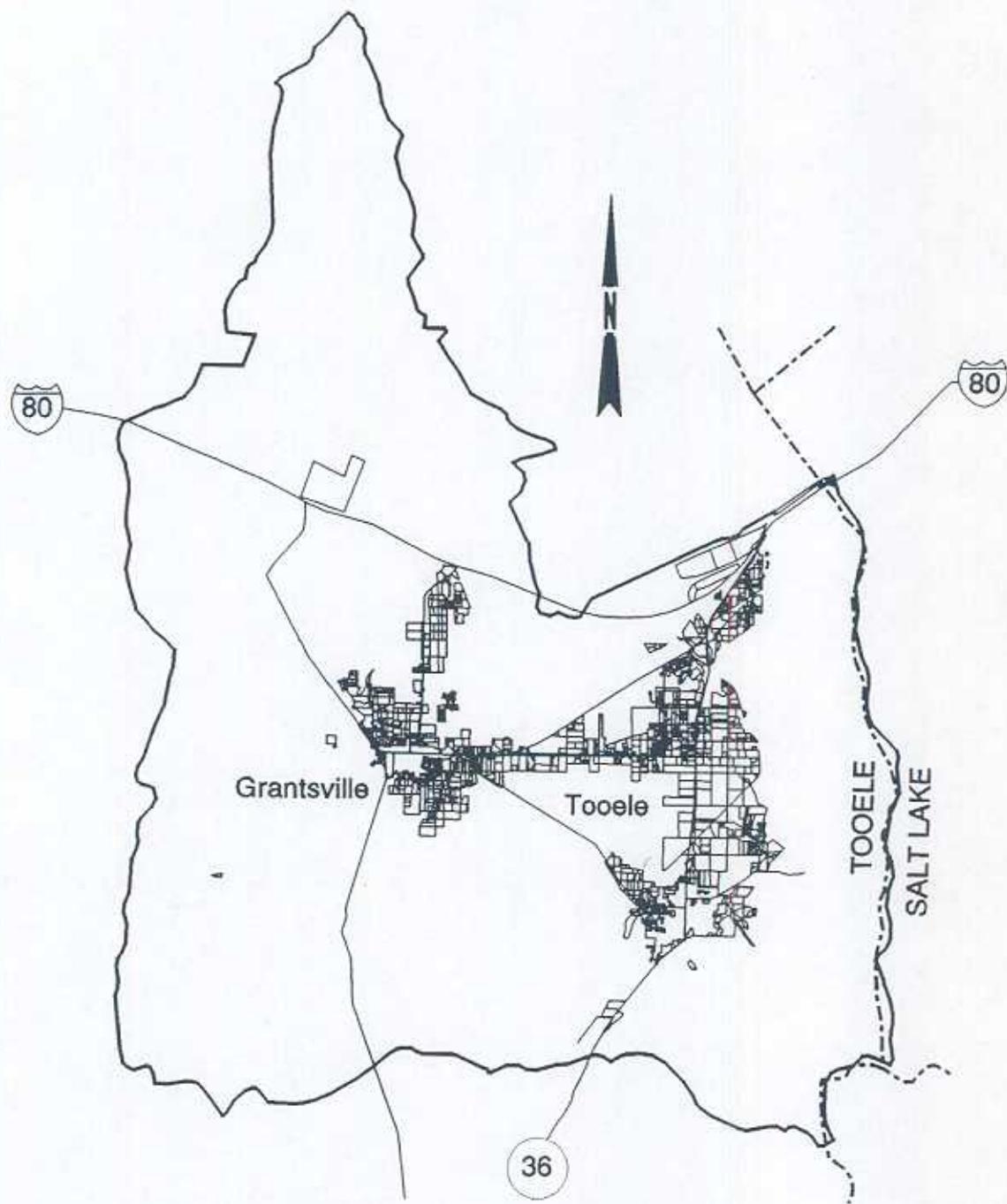


Figure 15. Water-related land use coverage of the Tooele Valley (01-05-002) subarea.

Land Cover Area Summary for Figure 16.
Great Salt Lake (01-06) study area.

Code	Land Cover	Box Elder	Davis	Salt Lake	COUNTY		Total Acres
					Tooele	Weber	
IIB-E	Wet/Vegetation Asp.	0.00	14,836.61	83.22	0.00	11,605.47	26,525.30
IIC	Wet Flats	3,350.01	15,025.59	276.07	0.00	10,010.68	28,662.35 ¹
IIF	Open Water	0.00	0.00	0.00	0.00	149.04	149.04
IIF2	Reservoirs	31.71	2,471.36	103.09	0.00	2,380.55	4,986.71
IIF4a	Temporary Flooded	0.00	0.00	0.00	0.00	0.86	0.86
IIF4c	Evaporation Pond	0.00	0.00	0.00	0.00	0.00	14,702.48
IIF5	Salt Water	580,664.74	214,823.82	15,255.17	196,098.62	55,741.79	1,062,584.14 ²
Total Water-related Land Use		584,046.46	247,157.38	15,717.55	196,098.62	79,888.39	1,122,908.40

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

²The Salt Water category includes: the Great Salt Lake, Evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217').

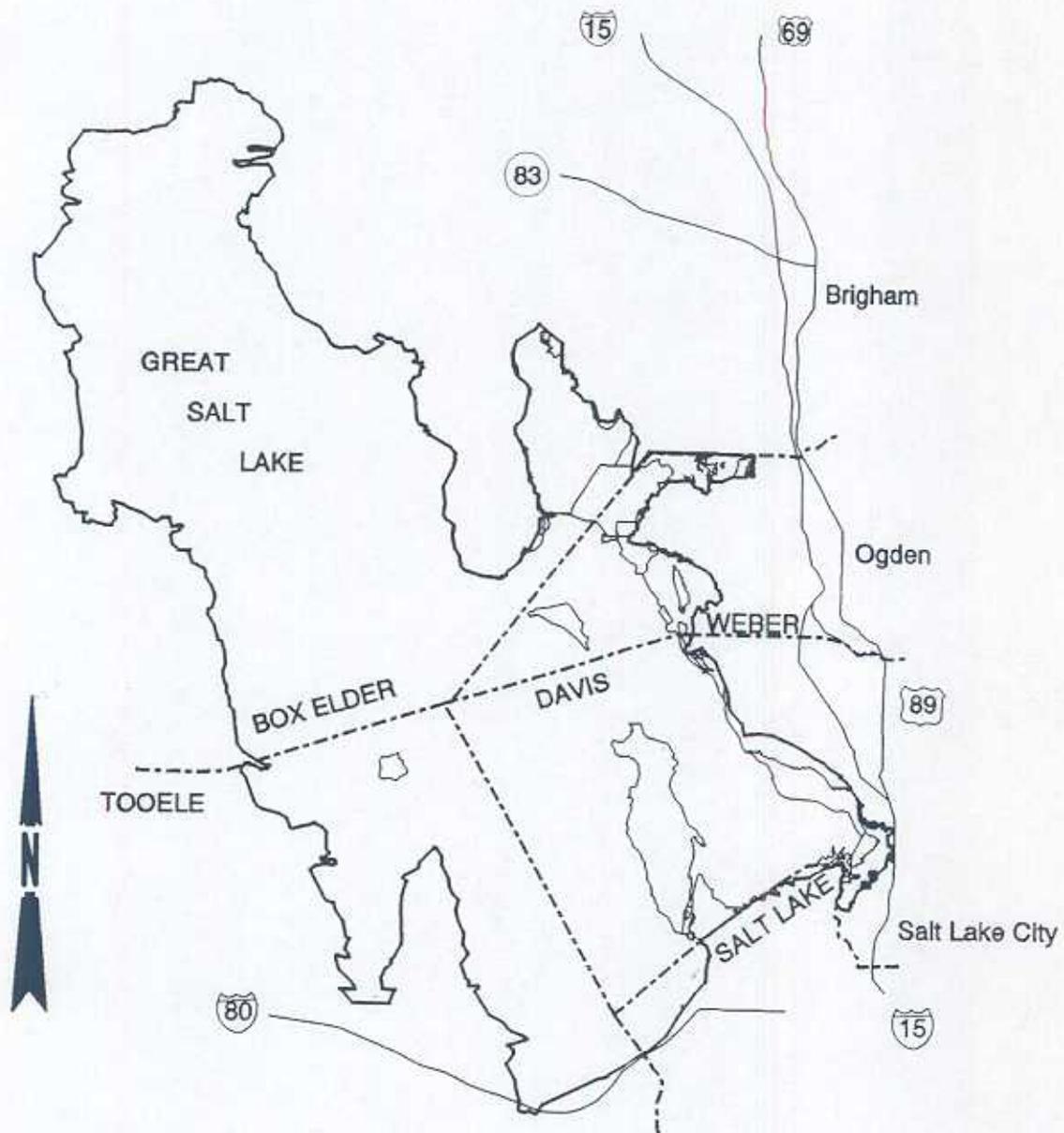


Figure 16. Water-related land use coverage of the Great Salt Lake (01-06) Study Area.

Land Cover Area Summary for Figure 17.
 Hansel Valley (01-07-001) subarea (Box Elder Co.).

Code	Land Cover	Acres
IA3a	Alfalfa	111.52
IA3b	Grass Hay	10.77
IA3d	Pasture	14.26
IB1a	Grain/Beans/Seeds (dry)	6,194.40 ¹
IB2a	Alfalfa (dry)	1,301.06 ¹
IB3a	Fallow (dry)	6,120.51 ¹
IB3b	Idle (dry)	3,878.35 ¹
IVC	Excavated Lands	15.94
VA1	Farmsteads	41.71
VA2	Open Spaces (rural)	40.01
Total Water-related Land Use		17,728.53

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Non-irrigated agriculture lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are normally not mapped. Acres shown in the table reflect only the number of acres mapped, not the total number of acres in the subarea.

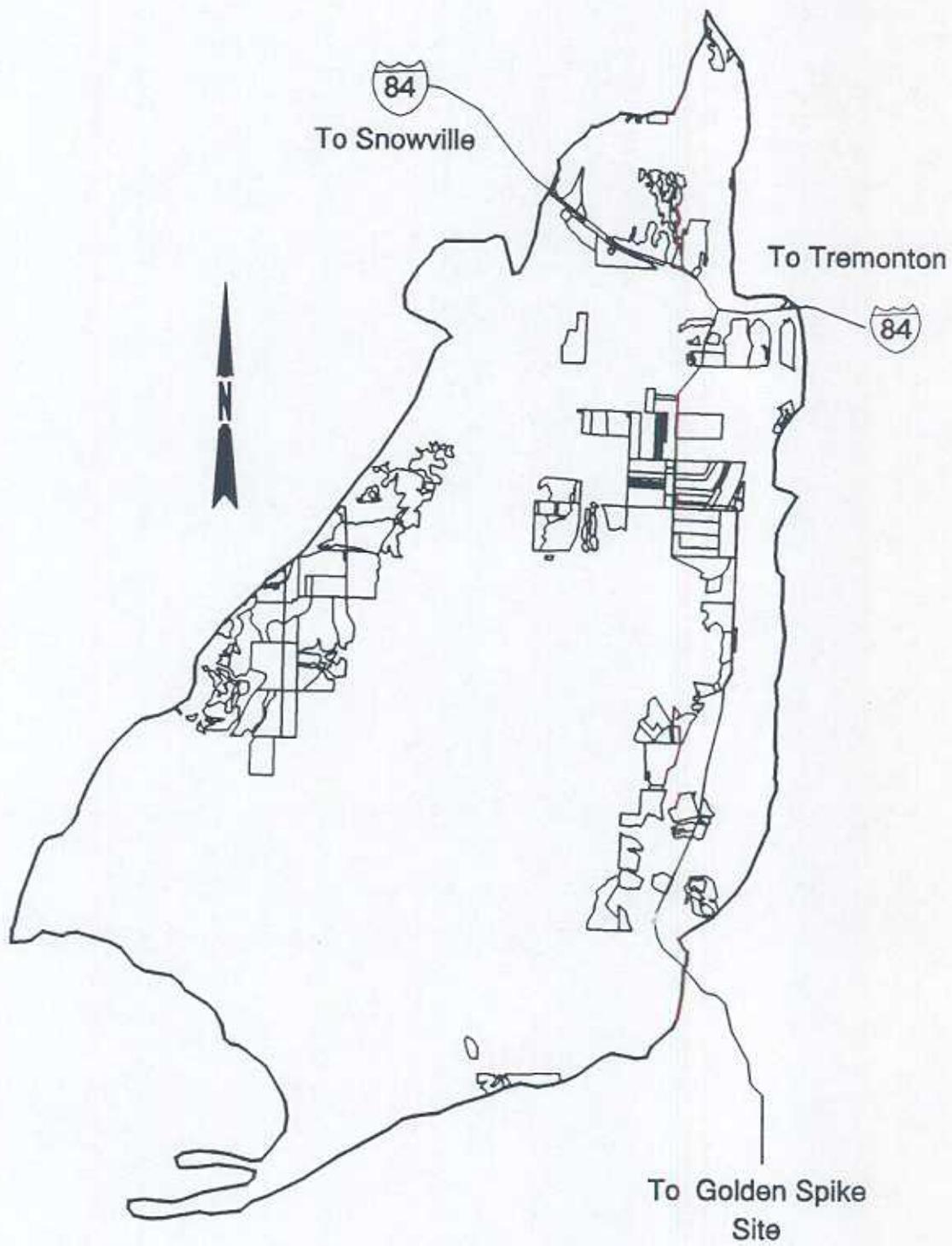


Figure 17. Water-related land use coverage of the Hansel Valley (01-07-001) subarea.

Land Cover Area Summary for Figure 18.
Blue Creek (01-07-002) subarea (Box Elder Co.).

Code	Land Cover	Acres
IA2a	Grain	1,352.54
IA3a	Alfalfa	1,103.36
IA3b	Grass Hay	222.22
IA3d	Pasture	556.78
IA4a	Fallow	123.38
IA4b	Idle	168.54
IB1	Row/Close Grown Crops (dry)	58.66 ¹
IB1a	Grain/Beans/Seeds (dry)	21,718.99 ¹
IB1a4	Safflower (dry)	476.90 ¹
IB2a	Alfalfa (dry)	617.85 ¹
IB2b	Pasture (dry)	1,383.24 ¹
IB3a	Fallow (dry)	17,490.71 ¹
IB3b	Idle (dry)	18,130.23 ¹
IIA1a	Pasture (surf & sub)	1,543.06
IIB-E	Wet/Vegetation Asp.	87.63
IIC	Wet Flats	43.47 ²
IIE	Riparian	32.47
IIF	Open Water	179.52
IIF4b	Sewage Lagoon	8.11
IVC	Excavated Lands	27.85
VA1	Farmsteads	111.36
VA2	Open Spaces (rural)	118.88
VB2	Residential (lo den)	66.40
VC2	Industrial	1,955.09
VC3	Open Spaces	974.05
Total Water-related Land Use		68,551.29

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Non-irrigated agriculture lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are normally not mapped. Acres shown in the table reflect only the number of acres mapped, not the total number of acres in the subarea.

²In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

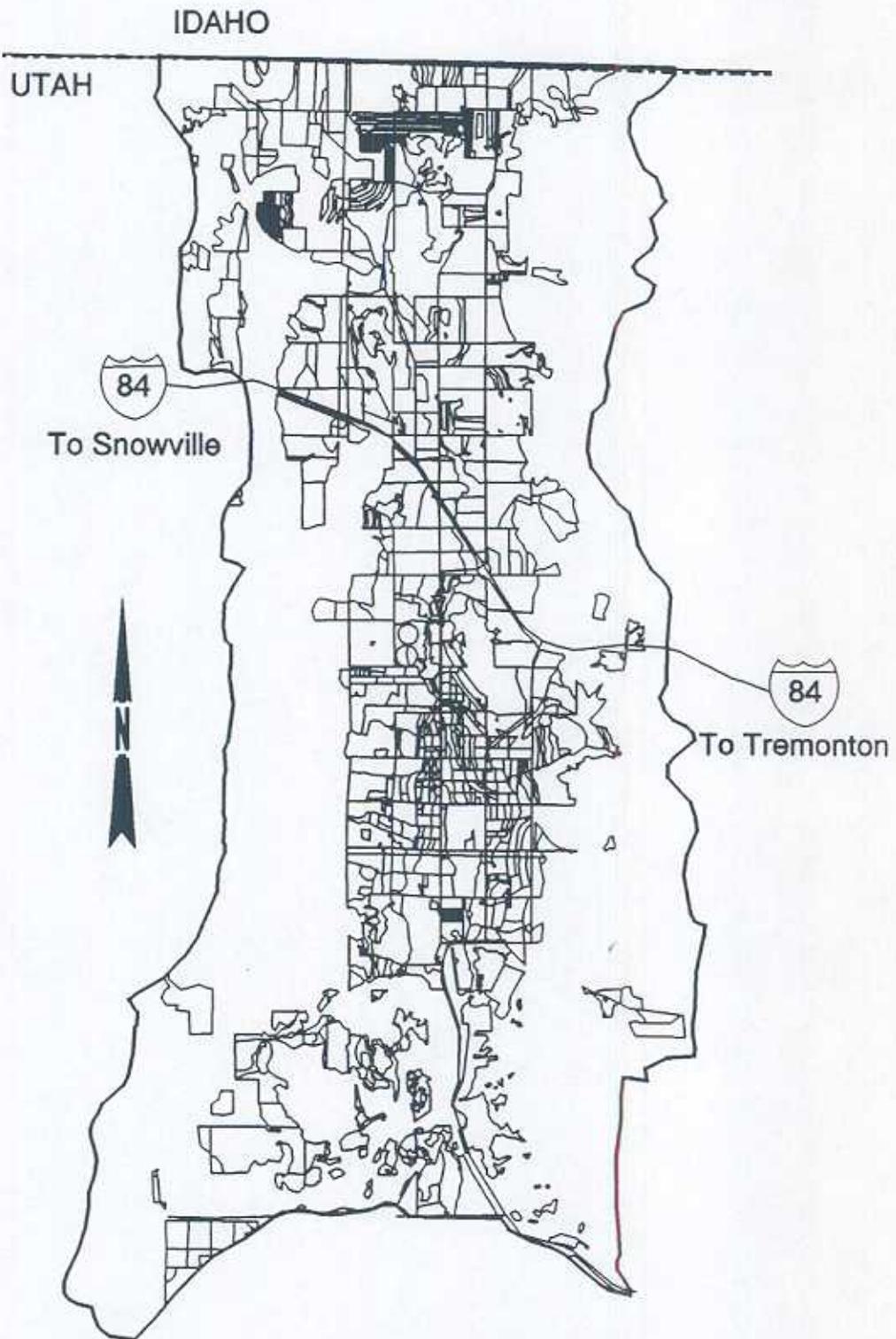


Figure 18. Water-related land use coverage of the Blue Creek (01-07-002) subarea.

Land Cover Area Summary for Figure 19.
Promontory Point (01-07-003) subarea (Box Elder Co.).

Code	Land Cover	Acres
IA3a	Alfalfa	28.32
IA3d	Pasture	84.43
IB1a	Grain/Beans/Seeds (dry)	2,146.96 ¹
IB1a4	Safflower (dry)	58.61 ¹
IB2a	Alfalfa (dry)	467.91 ¹
IB2b	Pasture (dry)	1,514.16 ¹
IB3a	Fallow (dry)	1,252.45 ¹
IB3b	Idle (dry)	1,292.62 ¹
IIA1a	Pasture (surf & sub)	3,306.66
IIA2a	Pasture (sub-irr.)	76.35
IIB	Cattail/Bullrush Asp.	524.52
IIB-E	Wet/Vegetation Asp.	19,173.94
IIC	Wet Flats	4,366.30 ²
IIF	Open Water	347.10
IIF4c	Evaporation Pond	1,121.76
IIF5	Salt Water	1,171.23 ³
IVC	Excavated Lands	4.28
VA1	Farmsteads	55.17
VA2	Open Spaces (rural)	40.27
VB2	Residential (lo den)	20.16
Total Water-related Land Use		25,709.53

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Non-irrigated agriculture lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are normally not mapped. Acres shown in the table reflect only the number of acres mapped, not the total number of acres in the subarea.

²In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

³The Salt Water category includes: the Great Salt Lake, Evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217').

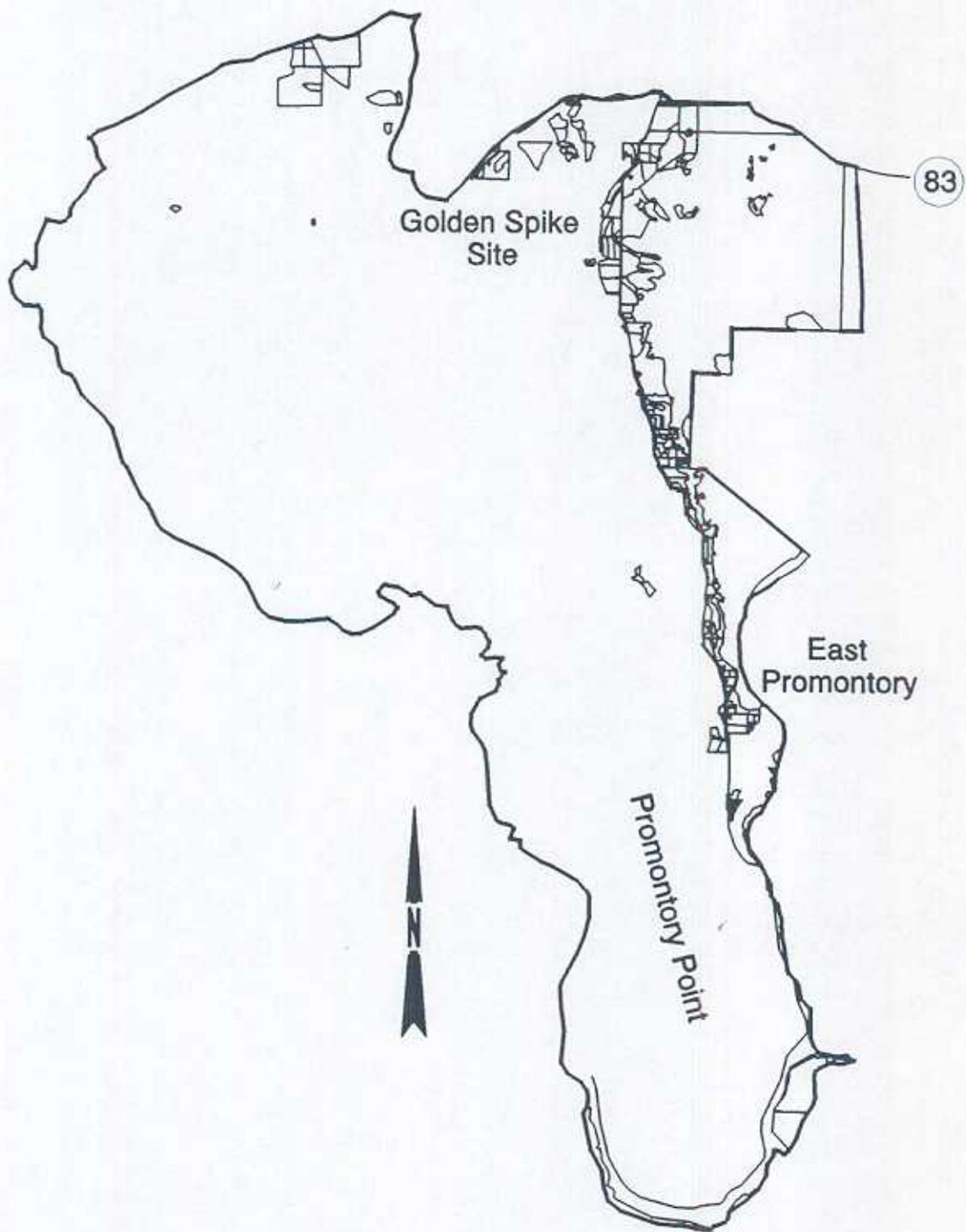


Figure 19. Water-related land use coverage of the Promontory Point (01-07-003) subarea.

The water-related land cover for all the subareas in the study unit is summarized in Table 2, and water-related land cover for the counties is summarized in Table 3.

The division inventoried over 1,818,870 acres of land in Box Elder, Davis, Juab, Millard, Salt Lake, Tooele and Weber counties. This amounts to 15.8 percent of the entire land area in the Great Salt Lake Desert Study Unit. Areas not inventoried are mainly desert, rangeland or national forest.

In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea. The Salt Water category includes: the Great Salt Lake, Evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217'). Evaporation ponds outside the shoreline of the Great Salt Lake Such as those used by Kennecott or American Salt are not included in the Salt Water category but are included in other categories. Non-irrigated agricultural lands are generally mapped if they fall within or border irrigated lands. Non-irrigated lands away from irrigated lands are often not mapped. Acres shown for this category reflect only the number of acres mapped, not the number of acres that may be in this category in the basin.

Table 2. Summary of land cover by subarea for the Great Salt Lake Desert Study Unit (acres).

Code	Cover	Grouse Cr. 01-01-001	Park Valley 01-01-002	Curlew Valley 01-01-003	No. GSL Desert 01-02-001	So. GSL Desert 01-02-002	Deep Creek 01-02-003	Snake Valley 01-03-001	Tule Valley 01-03-002
IA1a	Fruit	0	0	0	0	0	0	17	0
IA1e	Other Horticulture	0	0	0	0	0	0	0	0
IA2a	Grain	229	1,385	5,227	0	0	23	513	0
IA2a1	Corn	0	0	0	16	36	0	13	0
IA2b	Vegetables	0	0	0	0	0	0	0	0
IA2b1	Potatoes	0	0	0	0	0	0	0	0
IA2b2	Onions	0	0	0	0	0	0	0	0
IA2b3	Beans	0	0	0	0	0	0	0	0
IA2c	Other Row Crops	0	0	0	0	0	0	0	0
IA3a	Alfalfa	2,110	3,308	10,220	222	546	253	2,578	0
IA3b	Grass Hay	459	685	246	0	917	0	22	0
IA3c	Grass/Turf	0	0	0	0	0	0	0	0
IA3d	Pasture	1,305	1,365	340	236	437	3,963	2,533	0
IA4a	Fallow	0	87	772	0	0	0	36	0
IA4b	Idle Overgrown	668	1,213	4,065	81	897	539	968	0
IIA1a	Pasture (surr. & sub.)	0	237	197	0	515	0	1,057	0
IIA1b	Grass Hay (surr. & sub.)	0	408	0	0	0	0	0	0
Surface Irr. Cropland Subtotal		4,772	8,688	21,067	555	3,348	4,783	7,737	0
IIA2a	Sub. Irr. Pasture	0	0	0	0	317	0	0	0
IIA2b	Sub. Irr. Grass Hay	0	0	0	0	0	0	0	0
Sub. Irr. Cropland Subtotal		0	0	0	0	317	0	0	0
Irrigated Croplands Subtotal		4,772	8,688	21,067	555	3,665	4,783	7,737	0
II8	Cattail/Bullrush Aspect	24	483	0	0	5,659	0	0	0
II8-E	Wet/Vegetation Asp.	0	0	0	9,570	0	0	0	0
II8	Wet Flats	51	67	0	0	11,187	0	13	0
II8	Riparian	116	0	97	0	347	0	207	0
II8	Open Water	45	21	1,231	0	1,851	2	272	0
II8	Reservoirs	0	0	0	0	0	0	0	0
II8	Temporary Flooded	0	0	0	0	0	0	0	0
II8	Sewage Lagoon	0	0	0	0	41	0	0	0
II8	Evaporation Pond	0	0	0	17,426	21,695	0	0	0
II8	Salt Water	19	25,038	0	344,076	0	0	0	0
Wet/Open Water Subtotal		255	25,609	1,328	371,072	40,780	2	492	0
VA	Farmsteads	35	163	327	0	111	85	243	0
V8	Residential	78	31	93	0	166	18	50	0
V83	Open Spaces	0	0	3	0	0	0	0	0
VC	Commercial/Industrial	0	0	40	0	1,396	0	13	0
Residential/Industrial Subtotal		113	194	463	0	1,673	103	306	0
Land Use/Land Cover Totals		5,140	34,491	22,858	371,627	46,118	4,888	8,535	0

Footnotes for Table 2.

Summary of land cover by subarea for the Great Salt Lake Desert Study Unit.

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

²Some evaporation ponds were not photographed with 35 mm slides. Data were obtained from LANDSAT imagery.

³The Salt Water category includes: the Great Salt Lake, Evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217').

Table 2. Continued.

Code	Cover	Skull Valley 01-04-001	Rush Valley 01-06-001	Tooele Valley 01-05-002	Great Salt Lake 01-006	Hansel Valley 01-07-001	Blue Creek 01-07-002	Promontory Point 01-07-003	Total
IA1a	Fruit	0	0	0	0	0	0	0	19
IA1e	Other Horticulture	0	0	0	0	0	0	0	0
IA2a	Grain	47	508	2,793	0	0	1,353	0	12,078
IA2a1	Corn	0	0	382	0	0	0	0	447
IA2b	Vegetables	0	0	0	0	0	0	0	0
IA2b1	Potatoes	0	0	4	0	0	0	0	4
IA2b2	Onions	0	0	0	0	0	0	0	0
IA2b3	Beans	0	0	0	0	0	0	0	0
IA2c	Other Row Crops	0	0	0	0	0	0	0	0
IA3a	Alfalfa	1,554	2,803	4,667	0	112	1,103	28	29,504
IA3b	Grass Hay	48	290	1,820	0	11	222	0	3,920
IA3c	Grass/Turf	0	75	0	0	0	0	0	75
IA3d	Pasture	334	3,520	4,669	0	14	557	84	19,363
IA4a	Fallow	0	1,618	777	0	0	123	0	3,413
IA4b	Idle Overgrowth	137	1,115	1,355	0	0	169	0	11,207
IIA1a	Pasture (surf. & sub.)	177	298	256	0	0	1,543	3,307	7,587
IIA1b	Grass Hay (surf. & sub.)	0	0	0	0	0	0	0	408
Surface Irr. Cropland Subtotal		2,297	10,227	15,925	0	137	5,070	3,419	88,025
IIA2a	Sub. Irr. Pasture	0	72	0	0	0	0	76	465
IIA2b	Sub. Irr. Grass Hay	0	0	0	0	0	0	0	0
Sub. Irr. Cropland Subtotal		0	72	0	0	0	0	76	465
Irrigated Croplands Subtotal		2,297	10,299	15,925	0	137	5,070	3,495	88,490
IIB	Cattail/Bullrush Aspect	0	0	12	0	0	0	525	6,703
IIB-E	Wet/Vegetation Asp.	0	0	0	26,525	0	88	19,174	55,357
IIC	Wet Flats	0	0	7	28,663	0	43	4,366	44,397
IIE	Riparian	0	215	210	0	0	32	0	1,224
IIF	Open Water	10	2,722	378	149	0	180	347	7,208
IIF2	Reservoirs	0	0	0	4,987	0	0	0	4,987
IIF4a	Temporary Flooded	0	0	107	1	0	0	0	108
IIF4b	Sewage Lagoon	0	0	0	0	0	8	0	49
IIF4c	Evaporation Pond	0	0	2,572	0	0	0	0	41,693
IIF5	Salt Water	0	0	121	1,062,585	0	0	2,293	1,434,132
Wet/Open Water Subtotal		10	2,937	3,407	1,122,910	0	351	26,705	1,595,888
VA	Farmsteads	150	157	493	0	82	230	95	2,171
VB	Residential	14	474	4,567	0	0	66	20	5,577
VB3	Open Spaces	0	7	323	0	0	0	0	333
VC	Commercial/Industrial	74	88	457	0	0	2,929	0	4,997
Residential/Industrial Subtotal		238	726	5,840	0	82	3,225	115	13,078
Land Use/Land Cover Totals		2,545	13,962	25,172	1,122,910	219	8,546	30,315	1,697,426

¹See opposite page.

²See opposite page.

³See opposite page.

Footnotes for Table 3.

Summary of land cover by county for the Great Salt Lake Desert Study Unit.

¹In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Wet Flats are generally mapped if they fall within or border irrigated lands. Wet Flats alone are normally not mapped. Acres shown in the table reflect only the numbers of acres mapped, not the total numbers of acres in the subarea.

²Some evaporation ponds were not photographed with 35 mm slides. Data were obtained from LANDSAT imagery.

³The Salt Water category includes: the Great Salt Lake, Evaporation ponds within the shoreline of the Great Salt Lake such as those at AMAX or Great Salt Lake Minerals Co., the "West Desert Pond", and return flows from the pond to the main body of the Great Salt Lake. This acreage (obtained from existing maps and LANDSAT imagery) represents the Great Salt Lake at an average surface elevation (4200') and the West Desert Pond at maximum surface elevation (4217').

Table 3. Summary of land cover by county for the Great Salt Lake Desert Study Unit (acres).

Code	Cover	Beaver County	Box Elder County	Davis County	Iron County	Juab County	Millard County	Salt Lake County	Tooele County	Weber County	Total
IA1a	Fruit	0	0	0	0	0	0	0	0	0	19
IA1e	Other Horticulture	0	0	0	0	0	0	0	0	0	0
IA2a	Grain	8,194	0	0	0	0	0	0	0	3,371	12,078
IA2b	Corn	16	0	0	0	36	0	0	0	382	447
IA2b1	Vegetables	0	0	0	0	0	0	0	0	0	0
IA2b2	Potatoes	0	0	0	0	0	0	0	0	0	0
IA2b3	Onions	0	0	0	0	0	0	0	0	0	4
IA2c	Beans	0	0	0	0	0	0	0	0	0	0
IA2c1	Other Row Crops	0	0	0	0	0	0	0	0	0	0
IA3a	Alfalfa	17,103	0	0	0	553	0	0	0	9,270	29,504
IA3b	Grass Hay	1,623	0	0	0	763	0	0	0	1,515	3,920
IA3c	Grass/Turf	0	0	0	0	0	0	0	0	75	75
IA3d	Pasture	3,902	0	0	0	632	0	0	0	12,505	19,363
IA4a	Fallow	982	0	0	0	0	0	0	0	2,395	3,413
IA4b	Idle Overgrown	6,196	0	0	0	888	0	0	0	3,155	11,207
IA1A	Pasture (Surf. & Sub.)	5,284	0	0	0	362	0	0	0	1,233	7,587
IA1B	Gross Hay (Surf. & Sub.)	408	0	0	0	0	0	0	0	0	408
	Surface Irr. Cropland Subtotal	43,708	0	0	0	3,231	0	0	0	33,997	86,025
IA2a	Sub. Irr. Pasture	76	0	0	0	317	0	0	0	72	465
IA2b	Sub. Irr. Grass Hay	0	0	0	0	0	0	0	0	0	0
	Sub. Irr. Cropland Subtotal	76	0	0	0	317	0	0	0	72	465
	Irrigated Croplands Subtotal	43,784	0	0	0	3,548	0	0	0	33,979	88,490
IB	Cat/Ln/Bul/Trush Aspect	1,032	0	0	0	5,307	0	0	0	364	6,703
IE	Wet/Vegetation Asp.	28,832	14,837	0	0	0	83	0	0	11,615	55,357
IC	Wet Flats	7,877	15,026	0	0	590	0	276	0	10,617	44,397
IF	Evap/ln	245	0	0	0	192	0	0	0	710	1,224
IF	Open Water	1,824	0	0	0	1,745	0	0	0	3,218	7,268
IF2	Reservoirs	32	0	0	0	0	0	103	0	149	234
IF4a	Temporary Flooded	0	2,471	0	0	0	0	0	0	2,381	4,587
IF4b	Sewage Lagoon	0	0	0	0	0	0	0	0	1	108
IF4c	Evaporation Pond	0	0	0	0	0	0	0	0	41	47
IF5	Salt Water	814,548	214,824	0	0	0	0	15,255	0	41,694	1,076,321
	Wet/Open Water Subtotal	894,396	247,158	0	0	7,824	0	15,717	0	55,742	1,434,132
VA	Farmsteads	0	0	0	0	0	359	0	0	390,513	1,595,858
VB	Residential	932	0	0	0	111	243	0	0	885	2,171
VB3	Open Spaces	288	0	0	0	19	50	0	0	5,220	5,577
VC	Commercial/Industrial	3	0	0	0	0	0	0	0	330	333
	Residential/Industrial Subtotal	2,969	0	0	0	0	13	0	0	2,015	4,997
	Land Use/Land Cover Totals	4,192	0	0	0	130	306	0	0	8,450	13,078
	Land Use/Land Cover Totals	902,374	247,158	0	0	11,502	7,844	15,717	432,942	79,889	1,687,426

See opposite page
See opposite page
See opposite page

METHODOLOGY FOR GATHERING LAND USE DATA

Background

The methodology used by the division over the past 25 years in conducting water-related land use studies has varied with regard to the procedures used, detail, etc. Earlier inventories were prepared with large format vertical-aerial photographs supplemented with field surveys to label boundaries, vegetation types, and other water use information.

After identifying crops and labeling photographs, the photographs were projected onto a base map and then planimetered or "dot-counted" to determine the acreage. Tables for individual townships and ranges were prepared showing total land within every section and the amount of land in each land use category. Data were then available for use in preparing water budgets.

The water-related land use inventories completed by the division and the U.S. Soil Conservation Service (SCS) over the last 25 years have essentially covered the entire state. The two agencies have inventoried about 4 million acres (including 1.4 million acres of irrigated land) in order to acquire the data needed to prepare hydrologic inventories and to conduct other water-related studies in Utah.

In the early 1980s, the division began updating its methodology for collecting water-related land use data to take advantage of the rapidly growing fields of remotely sensed data and computerized Geographic Information Systems (GIS). Updating land use data for each hydrologic area of the state is an on-going process, and the division has now developed procedures for consistent data gathering and for updating it at 7- to 10-year intervals.

For several years, the division contracted with the University of Utah Research Institute, Center for Remote Sensing and Cartography (CRSC), to prepare water-related land use inventories. During this period, water-related land use data was obtained by using high altitude color infrared photography and laboratory interpretation, with field checking. More recently, the division has entered into cooperative agreements with several federal and other state agencies to complete and update all land use data for the state of Utah.

Present Method

In March 1984, several division staff members visited the California Department of Water Resources to observe its methodology for collecting water-related land use data for state water planning purposes. The division, based on its review of the California methodology and its own experience, developed a water-related land use inventory program. This program includes the use of 35mm slides, USGS 7-1/2 minute quadrangle maps, field-mapping using base maps produced from the 35mm photography and a computerized geographic information system to process, store and retrieve land use data.

The first step in a water-related land use inventory is to identify areas to be covered with aerial photography for any individual year. These areas are identified on maps of suitable scale (usually 1:100,000) using previous land use studies and other available information such as maps generated from high altitude color infrared photography or Landsat. Flight lines plotted on the maps show land areas to be covered with aerial photography. Flight lines are generally plotted running north and south through the center of the sections to be photographed. An exception to the

practice is a long narrow canyon with irrigated land only in the bottom. When this situation is encountered, the flight line will follow the canyon without regard to section lines or compass directions.

During the second step, identified areas are photographed using 35mm slide film. Ideally, the 35mm photography should be conducted at a time of year that shows the highest contrast between the water-related land use areas (mainly irrigated land) and surrounding areas. When field mapping/checking is to be conducted in the same season, the photographs are taken as early in the growing season as possible. The division has generally found that the period from June 15 to July 15 is the best time for this photography.

The division specifies that aerial photographs be obtained using an aircraft (Figure 20) carrying a high quality 35mm single lens reflex camera mounted to focus along a vertical axis to the earth. A 24mm lens is required and photos must be taken between 6,000 and 6,500 feet above the ground. This procedure allows each slide to cover a little more than one square mile with approximately 30 percent overlap on the wide side of the slide and 5 percent on the slide's narrow side. High quality commercial color positive film is used with appropriate commercial processing after each day's flight. The slides are then cataloged according to the flight-line number and shown on a location map. All 35mm slides are stored in files at the division offices and cataloged according to individual quadrangle map location.

After cataloging the slides, the division transfers boundaries of water-related areas from the slide to USGS 7-1/2 minute quadrangle maps using a standard slide projector with a 100-200mm zoom lens. The image is directed from the projector, located below a glass table top, to a 45 degree first surface mirror to the back of a quadrangle map. The image showing through

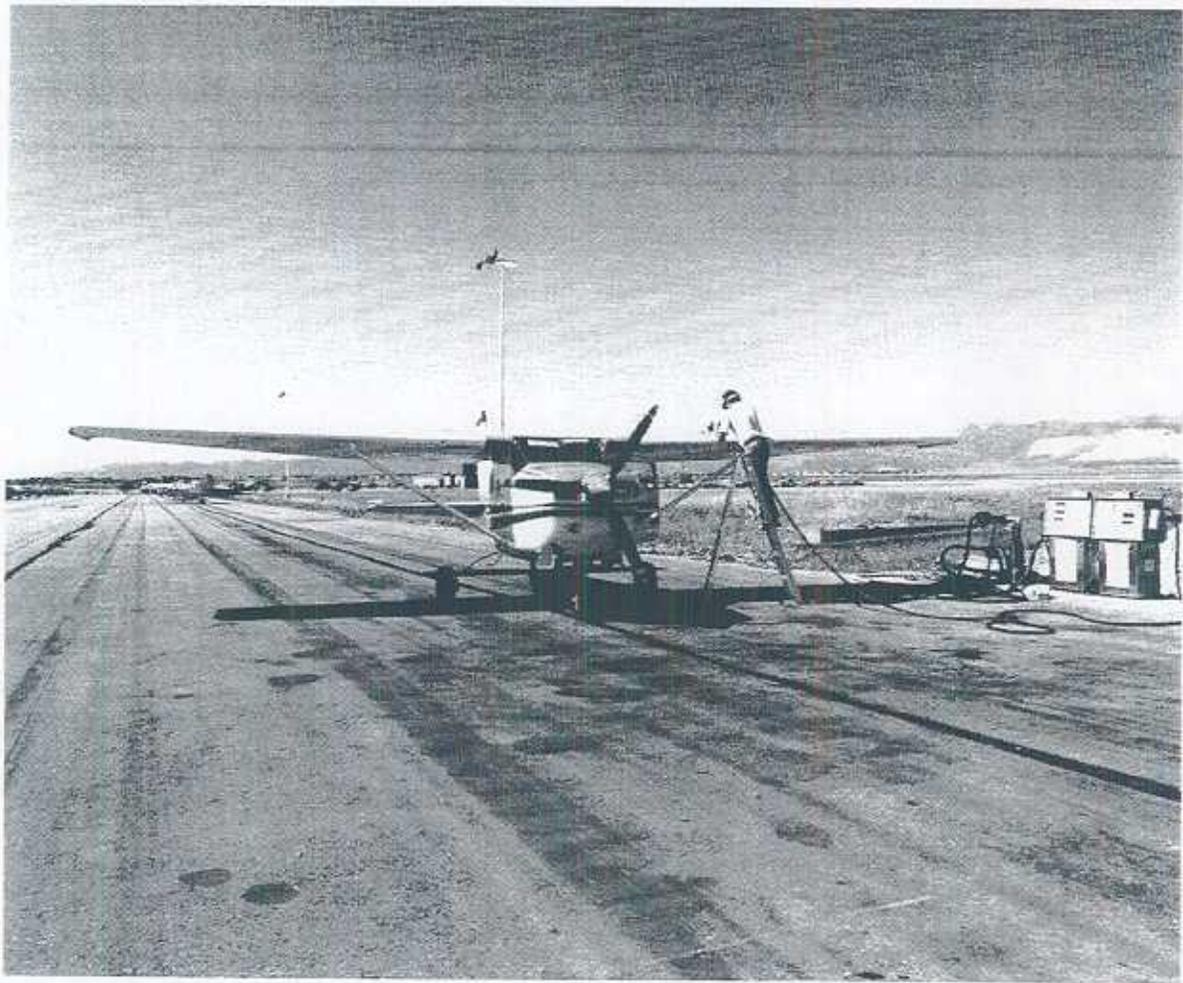


Figure 20. Typical aircraft used for aerial photography.

the map is adjusted to the map scale with the zoom lens. Field boundaries and other water-use boundaries are then traced on the 7-1/2 minute quadrangle map. At the same time, a technician attempts to identify the category of land use or land cover and uses a code for the appropriate category in each water use area on the field map. The date that transfer of slide data was completed is also noted on the map. Figure 21 illustrates this basic procedure.

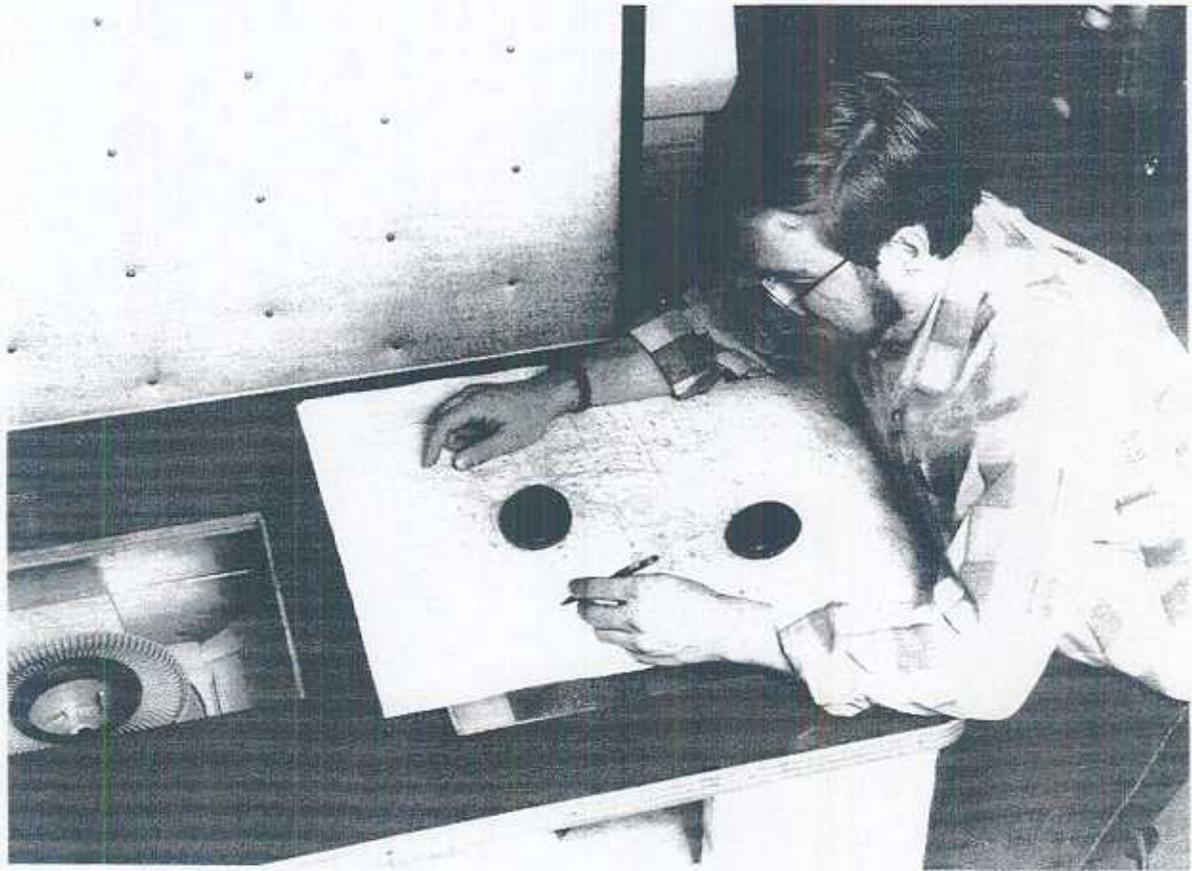


Figure 21. Mapper transferring slide data to field map.

After the slide data are transferred to the quadrangle map, a two-person team uses the map in the field to check the boundaries and land use data on the quadrangle and marks in red the actual land use or land cover category if it is different than the category originally identified. After the land classification on the quadrangle map has been field-checked, the field team marks the completion date on the edge of the map. Figure 22 shows a Division of Water Resources field map after field-checking has been completed.

The next step is to digitize and process the field data. Digitizing is the process of converting data from map or image form to digital form for computer analysis. Typically, digitizing and entering the categories of land use into the computer is performed during the fall and winter following the aerial photography. This is accomplished by using ESRI ARC/INFO Software and a digitizer board large enough to hold a quadrangle map. The division's digitizing work station is shown in Figure 23. All processed data is filed in the State AGRC database. The division uses the special data management and geographic information management capabilities of the AGRC ARC/INFO system to produce tabulated water-related land use maps.

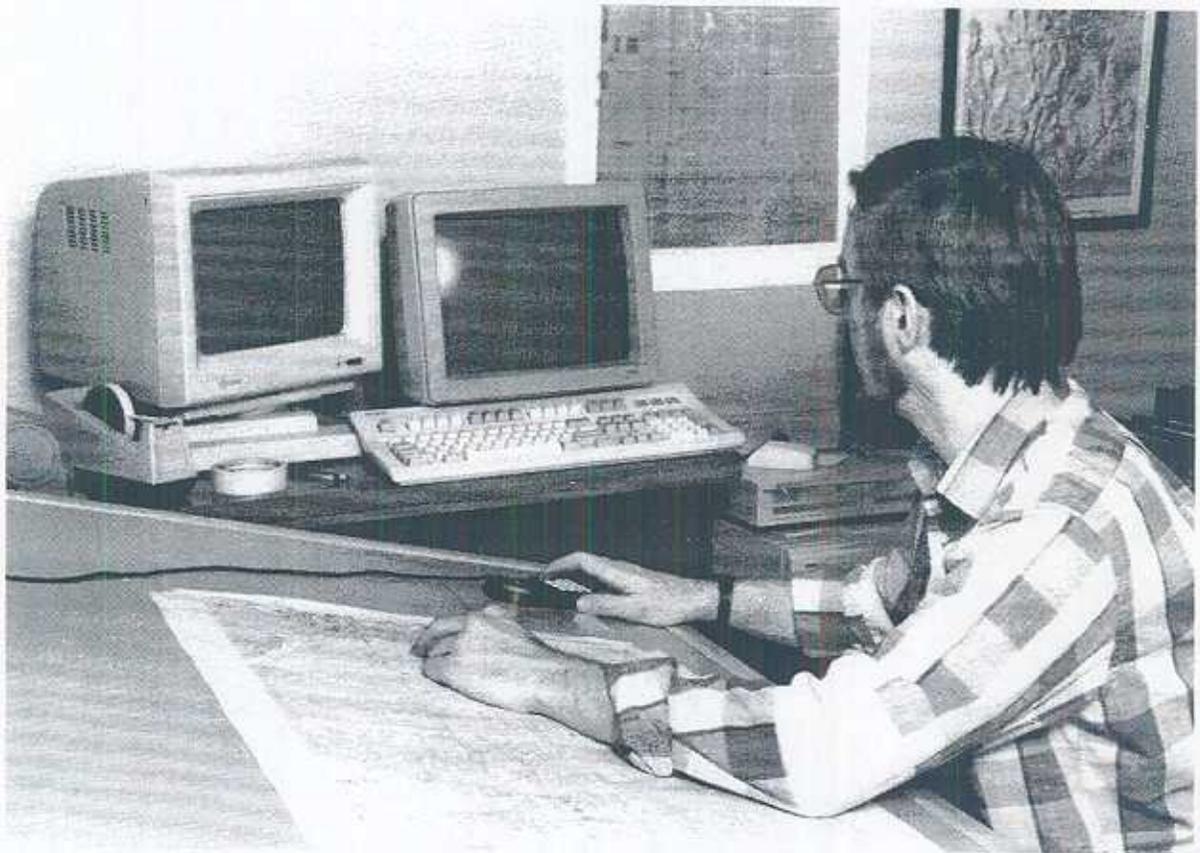


Figure 23. Digitizing work station.

Once the land use data have been digitized and processed through the AGRC ARC/INFO system, the division plots out a 7-1/2 minute quadrangle line map of the data. These plots are overlaid on the field maps to check for errors in recording or digitizing. An example of a line map of the Monument Peak NW quadrangle is shown in Figure 24.

Computer-Generated Line Maps Legend for Figure 24.
Great Salt Lake Desert Study Unit.

Label	Code	Cover Type
O	IA1a	Orchards
BR	IA1e	Berries
G	IA2a	Grain
C	IA2a1	Corn
V	IA2b	Vegetables
PO	IA2b1	Potatoes
ON	IA2b2	Onions
B	IA2b3	Beans
T	IA2b4	Tomatoes
S	IA2c	Other Row Crops
A	IA3a	Alfalfa
P1	IA3b	Grass Hay
P	IA3d	Pasture
TF	IA3e	Turf/Grass Yards
F	IA4a	Idle-Plowed
I	IA4b	Idle-Overgrown
DG	IB1a	Non Irr. Crops
DA	IB2a	Non Irr. Alfalfa
DP	IB2b	Non Irr. Pasture
DF	IB3a	Non Irr. Idle-Plowed
DI	IB3b	Non Irr. Idle-Overgrown
IWP	IIA2a1	Irrigated Wet Pasture
IWP1	IIA2a2	Irrigated Wet Grass Hay
WP	IIA2b1	Wet Pasture/Non Irr.
WP1	IIA2b2	Non Irr. F.W. Hay Land
WF	IIC	Wet Flats
WR	IIB	Cattail/Bulrush
W	IIF	Open Water
WM	IIF4a	Temp. Flooded/Marsh
SL	IIF4b	Sewage Lagoons
EP	IIF4c	Evaporation Pond
R	VB1	Buildings/Homes
R2	VB2	Buildings/Homes
RP	VB3	Open Spaces
R	VB6a	Residential
CM	VC1	Commercial
CI	VC2	Industrial
CS	VC3	Open Spaces

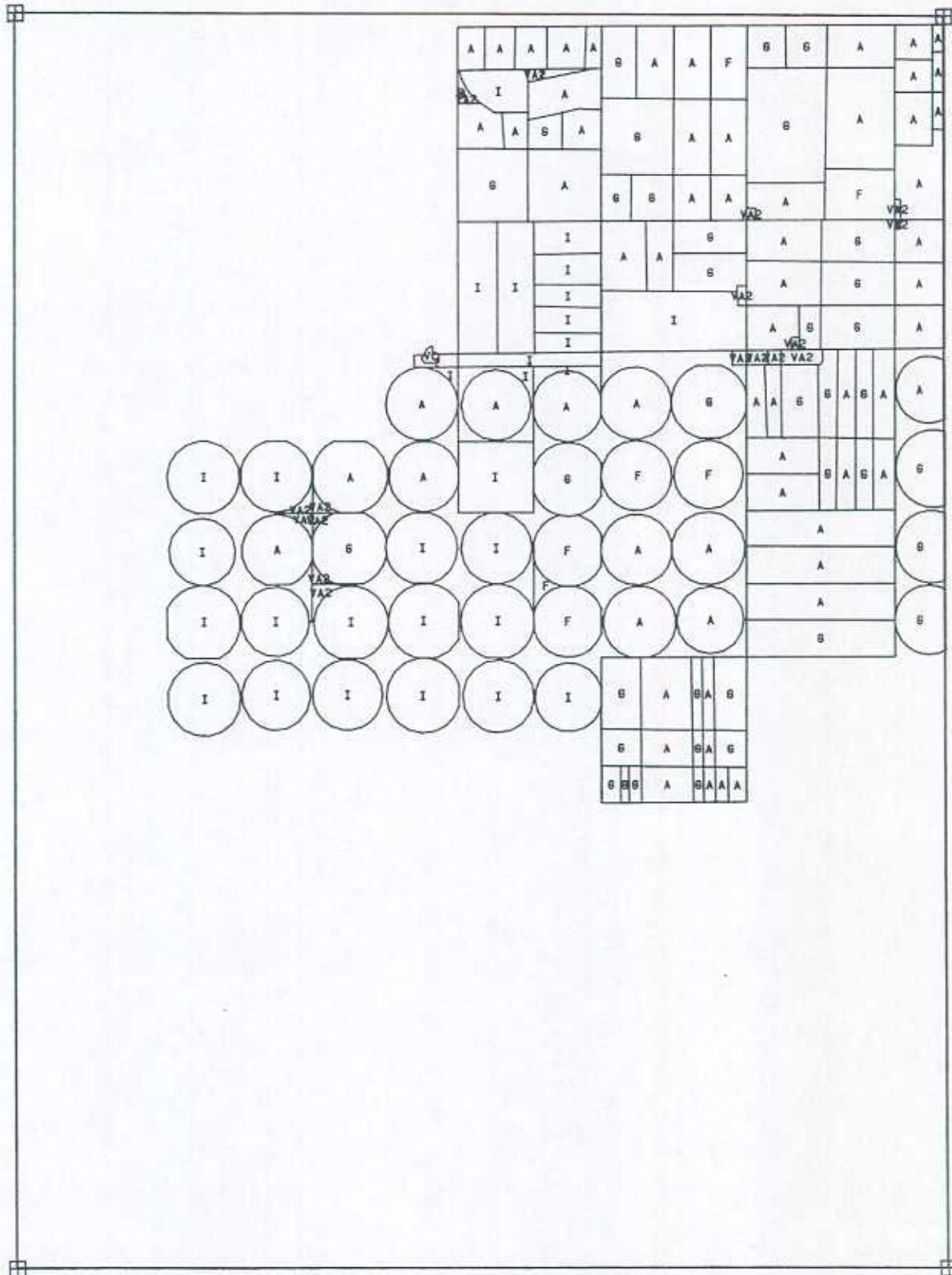


Figure 24. Computer-generated line map of the Monument Peak NW 7-1/2 minute quadrangle.

Once checked, the data in the AGRC ARC/INFO system become available for use in water resource planning studies. A map of the Monument Peak NW quadrangle, similar to what might be obtained from the AGRC, is shown in Figure 25.

Legend for computer generated color map Figure 25.

	IA1a	FRUIT	
	IA1e	BERRIES	
	IA2a	GRAIN	
	IA2a1	CORN	
	IA2a2	SORGHUM	
	IA2b	VEGETABLES	
	IA2b1	POTATOES	
	IA2b2	ONIONS	
	IA2b3	BEANS	
	IA2c	OTHER ROW CROPS	
	IA3a	ALFALFA	
	IA3b	GRASS HAY	
	IA3c	GRASS/TURF	
	IA3d	PASTURE	
	IA4a	FALLOW	
	IA4b	IDLE	
	IIA1a	PASTURE	
	IIA1b	HAYLAND	
	IIA2a	PASTURE	
	IIA2b	HAYLAND	
	IB	NON IRR. CROPLAND	
	IB1a	GRAIN	
	IB2a	ALFALFA	
	IB2b	PASTURE	
	IB3a	FALLOW	
	IB3b	IDLE	
	IIC	WET FLATS	
	IIE	RIPARIAN	
	IIF	OPEN WATER	
	IIF4a	TEMP. FLOODED	
	IIF4b	SEWAGE LAGOON	
	VB	RESIDENTIAL	
	VB4	OPEN SPACES	
	VC	COMMERCIAL/INDUSTR.	

— IRRIG. CROPLAND

— GRASSY/PHREATO.

— NON-IRRIG. CROPLAND

— GRASSY/PHREATO./WATER

— BUILT-UP LAND

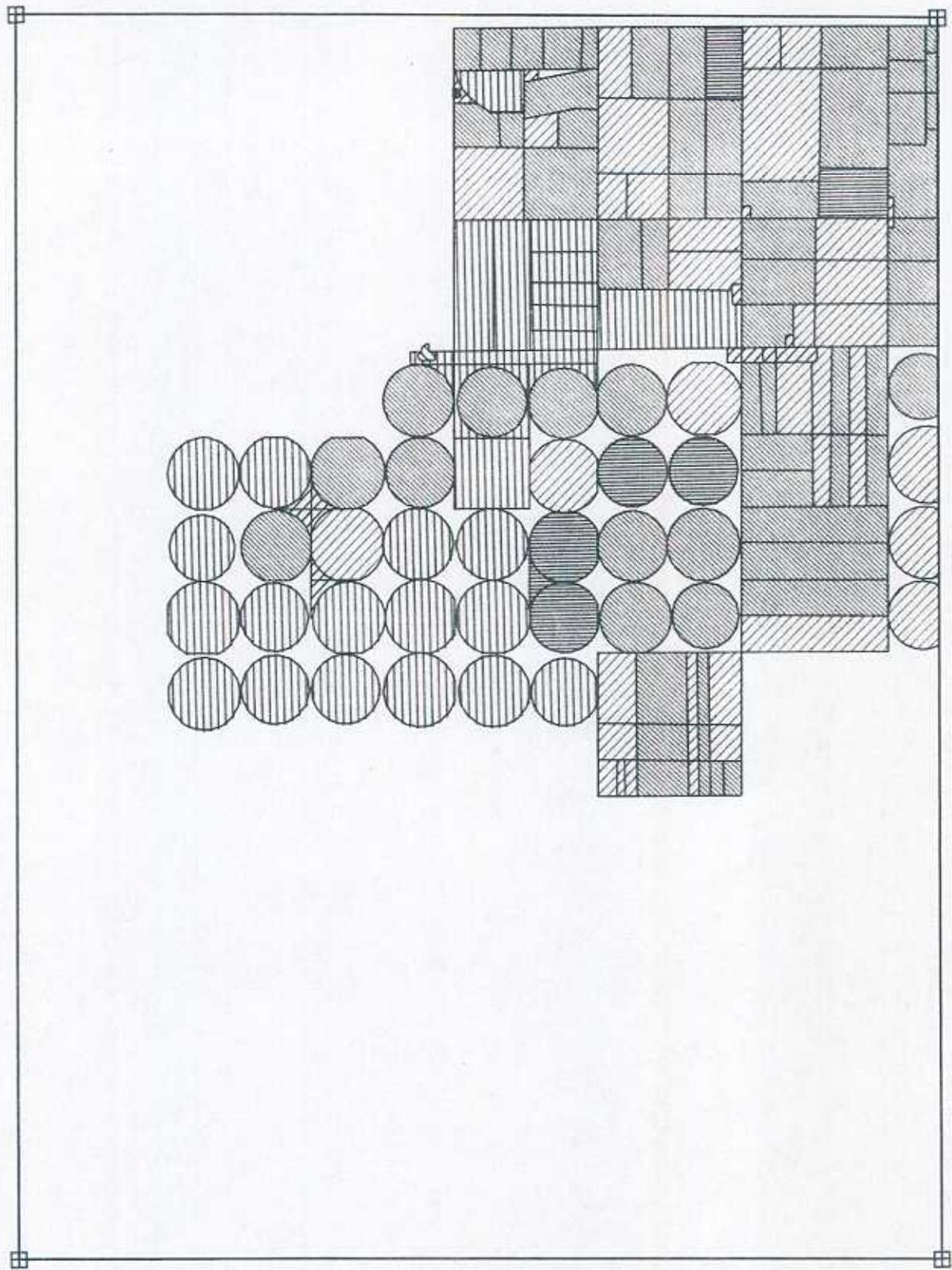


Figure 25. Final computer-generated map of the Monument Peak NW 7-1/2 minute quadrangle.

LAND USE CATEGORIES

During the division's years of collecting water-related land use data, land use categories and map codes have varied from inventory to inventory.

In late 1984, at the beginning of the division's new phase of mapping water-related land use, an Active Mappers Committee was formed. The committee reviewed all ongoing mapping efforts in the state and then focused on the issue of coordinating and standardizing map data. A summary of the committee's work is given in Appendix B. The division is committed to using the *1988 Standard Cover Types and Codes List* developed from this committee. Codes from this standard cover type list, with descriptive information, are shown in Table 1.

As each water-related land use inventory for the state is completed and, also, when some areas are re-inventoried, it is useful in some instances to tabulate and compare inventories and respective changes. Because of the different names of cover type and codes that were used earlier to the *1988 Standard Cover Types and Codes List*, it becomes necessary that earlier names of cover types and codes should be provided in this report. Table 4 shows the codes from earlier studies that relate to the standard cover types. Appendix C lists the previous land use studies conducted by the division.

Table 4. List of cover types and land use codes (standardized in 1988) for the State of Utah with the state code and comparisons of the 1988 standard code and cover type to previous land use inventories.

STATE CODE	COVER TYPES (Standardized in 1988)	UTAH LK. (66) ^a BEAR R. (69) WEBER R. (70)	UINTAH (67) W. COLO. (67) VIRGIN R. (78) UINTA B. (80)	SALT LAKE COUNTY (82)	U. SEVIER (81) M. SEVIER (83) L. SEVIER (85) BEAR R. (86) WEBER R. (87)
I	Cropland	- ^b	-	-	* ^c
IA	Irrigated	A ^d	A	-	*
IAI	Hort. & Specialty Crops	-	-	-	*
IA1a	Fruit	A8	A16	-	*
IA1a1	Cherry	-	-	-	*
IA1a2	Apple	-	-	-	*
IA1a3	Peach	-	-	-	*
IA1a4	Pear	-	-	-	*
IA1a5	Apricot	-	-	-	*
IA1a6	Other	-	-	-	*
IA1b	Nuts	-	-	-	*
IA1b1	Walnut	-	-	-	*
IA1b2	Pecan	-	-	-	*
IA1b3	Other	-	-	-	*
IA1c	Vineyard	-	-	-	*
IA1d	Bush Fruit	-	-	-	*
IA1e	Berries	-	-	-	*
IA1f	Nurseries	-	-	-	*
IA1g	Other	-	-	-	*
IA2	Row & Close-Grown Crops	-	-	-	*
IA2a	Grain	A4	-	Ag	*
IA2a1	Corn	A5	A1	-	*
IA2a2	Sorghum	-	-	-	*
IA2a3	Wheat	-	A9	-	*
IA2a4	Barley	-	A7	-	*
IA2a5	Oats	-	A8	-	*
IA2a6	Other	-	-	-	*
IA2b	Vegetables	-	-	-	*
IA2b1	Potatoes	A7	A3	-	*
IA2b2	Onions	-	-	-	*
IA2b3	Beans	A13	-	-	*
IA2b4	Tomatoes	A10	A5	-	*
IA2b5	Sweet Corn	-	-	-	*
IA2b6	Other	A6,A9,A11	A2,A4,A6	-	IA2b5*

- ^a The data in parentheses (66) identifies the year the field checking was conducted for the various inventories.
^b The dash (-) indicates that there was no corresponding cover type mapped for the above inventories.
^c The asterisk (*) indicates that the cover type for the above inventories is the same as the 1988 standard cover types.
^d The use of a code, such as the (A) footnoted, indicates that the code used for the above inventory corresponds to the 1988 standard cover types.
^e The codes that appear in this column are those that are different than the 1988 standard code.

Table 4. Continued.

STATE CODE	COVER TYPES (Standardized in 1988)	UTAH LAKE (66) ¹			UINTAH (67)		SALT LAKE COUNTY (82)		U. SEVIER (81)	
		BEAR R. (69)	WEBER R. (70)	W. COLO. (67)	VIRGIN R. (78)	UINTA B. (80)			M. SEVIER (83)	L. SEVIER (85)
IA3	Forage Crops	-	-	-	-	A	-	-	*	
IA3a	Alfalfa	A1	-	A10	-	-	-	-	*	
IA3b	Grass Hay	A3	-	A12	-	-	-	-	*	
IA3c	Grass/Turf	-	-	-	-	-	-	-		IA3e
IA3d	Pasture	A2	-	A13	-	-	-	-	*	
IA3e	Other	-	-	A11	-	-	-	-		IA3c
IA4	Other	-	-	A18	-	Ai	-	-	*	
IA4a	Fallow Plowed	-	-	-	-	-	-	-	*	
IA4b	Idle (Overgrown)	A12	-	A17	-	-	-	-	*	
IB	Non-Irrigated	E	-	8	-	D	-	-	*	
IB1	Row & Close-Grown Crops	-	-	-	-	-	-	-	*	
IB1a	Grain (Beans, Seeds)	E1	-	-	-	-	-	-	*	
IB1a1	Wheat	-	-	82	-	-	-	-	*	
IB1a2	Other Grains	-	-	83	-	-	-	-	*	
IB1a3	Dry Beans	-	-	84	-	-	-	-	*	
IB1a4	Safflower	-	-	-	-	-	-	-	*	
IB2	Hayland Crops	-	-	-	-	-	-	-	*	
IB2a	Alfalfa	E2	-	81	-	-	-	-	*	
IB2b	Pasture	E3	-	85	-	-	-	-	*	
IB2c	Other	E5	-	-	-	-	-	-	*	
IB3	Other (Plowed)	-	-	87	-	-	-	-	*	
IB3a	Fallow	E4	-	86	-	Df	-	-	*	

¹ The data in parentheses (66) identifies the year the field checking was conducted for the various inventories.

² The dash (-) indicates that there was no corresponding cover type mapped for the above inventories.

³ The asterisk (*) indicates that the cover type for the above inventories is the same as the 1988 standard cover types.

⁴ The use of a code, such as the (A) footnoted, indicates that the code used for the above inventory corresponds to the 1988 standard cover types.

⁵ The codes that appear in this column are those that are different than the 1988 standard code.

Table 4. Continued.

STATE CODE	COVER TYPES (Standardized in 1988)	UTAH LAKE (66) ¹	UINTAH (87)		U. SEVIER (81)
		BEAR R. (69)	W. COLO. (67)	SALT LAKE COUNTY (82)	M. SEVIER (83)
		WEBER R. (70)	VIRGIN R. (78)		L. SEVIER (85)
			UINTA B. (80)		BEAR R. (86)
					WEBER R. (87)
II	Meadow/Wetlands/Open Water	C	O,F	-	*
IIA	Grassy Aspect	-	-	-	*
IIA1	Irrigated	-	-	-	*
IIA1a	Pasture	-	A14	-	IIA1a1,2a1
IIA1b	Hayland	-	A15	-	IIA1a2,2a2
IIA2	Non-Irrigated	-	-	-	*
IIA2a	Pasture	C4	8,F8	Ws	IIA1b1,2b1
IIA2b	Hayland	-	-	-	IIA1b2,1b2
IIA2c	Non-Agricultural Use	-	-	-	IIA1b3,2b3
IIB	Cattail/Bullrush	C1	F4	Wc	*
IIC	Wet Flats (barren)	-	-	M	*
IID	Shrub Aspect	C5	F2	-	*
IIE	Riparian	C2	-	Wr	*
IIE1	Forested Aspect	-	F1	-	*
IIE2	Shrub Aspect	C3	3,5,6,7,9	-	*
IIF	Open Water	B	E	-	*
IIF1	Streams	-	-	-	*
IIF2	Reservoirs	-	E1,E2	-	*
IIF3	Ponds/Lakes	-	E4	-	*
IIF4	Other	-	E3	-	*
IIF4a	Temporarily Flooded	-	-	-	*
IIF4b	Sewage Lagoon	-	-	-	*
IIF4c	Evaporation Pond	-	-	S	IIF4c,VC2

- ¹ The data in parentheses (66) identifies the year the field checking was conducted for the various inventories.
- ² The dash (-) indicates that there was no corresponding cover type mapped for the above inventories.
- ³ The asterisk (*) indicates that the cover type for the above inventories is the same as the 1988 standard cover types.
- ⁴ The use of a code, such as the (A) footnoted, indicates that the code used for the above inventory corresponds to the 1988 standard cover types.
- ⁵ The codes that appear in this column are those that are different than the 1988 standard code.

Table 4. Continued.

STATE CODE	COVER TYPES (Standardized in 1988)	UTAH LAKE (66) ¹ BEAR R. (69) WEBER R. (70)	UINTAH (67) W. COLO. (67) VIRGIN R. (78) UINTA B. (80)	SALT LAKE COUNTY (82)	U. SEVIER (81) M. SEVIER (83) L. SEVIER (85) BEAR R. (86) WEBER R. (87)
III	Range & Forest Land	-	-	-	*
IIIA	Alpine Plants	-	-	-	*
IIIB	Conifer	-	-	Uc	*
IIIB1	Douglas/White Fir	-	-	-	*
IIIB2	Ponderosa	-	-	-	*
IIIB3	Fir/Spruce	-	-	-	*
IIIB4	Lodgepole Pine	-	-	-	*
IIIB5	Pinyon-Juniper	-	-	-	*
IIIB6	Etc.	-	-	-	*
IIIC	Deciduous	-	-	Ud	*
IIIC1	Aspen	-	-	-	*
IIIC2	Mountain Brush	-	-	-	*
IIIC3	Etc.	-	-	-	*
IIID	Grass Aspect	-	-	-	*
IIID1	Dry Pasture	-	-	-	*
IIID2	Native Grasses	-	-	Ug	*
IIID3	Etc.	-	-	-	*
IIIE	Shrub Aspect	-	-	-	*
IIIE1	Northern Desert Shrub	-	-	Um	*
IIIE1a	Sagebrush	-	-	-	*
IIIE1b	Etc.	-	-	-	*
IIIE2	Southern Desert Shrub	-	-	-	*
IIIE2a	Creosote Bush	-	-	-	*
IIIE2b	Etc.	-	-	-	*
IIIE3	Salt Desert Shrub	-	-	-	*
IIIE3a	Shadescale	-	-	-	*
IIIE3b	Greasewood	-	-	-	*
IIIE3c	Saltbrush	-	-	-	*
IIIE3d	Desert Molley	-	-	-	*
IIIE3e	Etc.	-	-	-	*

¹ The data in parentheses (66) identifies the year the field checking was conducted for the various inventories.

² The dash (-) indicates that there was no corresponding cover type mapped for the above inventories.

³ The asterisk (*) indicates that the cover type for the above inventories is the same as the 1988 standard cover types.

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Table 4. Continued.

STATE CODE	COVER TYPES (Standardized in 1988)	UTAH LAKE (66) ¹	UINTAH (67) W. COLO. (67)	SALT LAKE COUNTY (82)	U. SEVIER (81) M. SEVIER (83) L. SEVIER (85) BEAR R. (86) WEBER R. (87)
		BEAR R. (69) WEBER R. (70)	VIRGIN R. (78) UINTA B. (80)		
IV	Barren Lands	-	-	-	*
IVA	Bare Soil/Sand	-	-	-	*
IVA1	Dry Salt Flats	-	-	-	*
IVA2	Beaches	-	-	-	*
IVA3	Other Sandy Areas	-	-	-	*
IVA4	Other	-	-	-	*
IVB	Rock Outcrop	-	-	Ur	*
IVC	Excavated Land	-	-	E	*
IVD	Other	-	-	-	*
V	Built-Up Land	D	C	-	*
VA	Farmstead	-	-	-	*
VA1	Builds/Homes	-	C1,C5	-	*
VA2	Open Spaces	-	C4	-	*
VB	Residential	-	-	-	*
VB1	High Density	-	C3	Rt,R	VB1,VB2,VB6a
VB2	Low Density	-	-	R1	VB3
VB3	Open Spaces	-	C2	L	VB4
VB4	Idle	-	-	-	*
VC	Commercial/Industrial	F	D	C	*
VC1	Commercial	-	-	-	*
VC2	Industrial	-	-	-	VC4
VC3	Open Spaces	-	-	X	*
VD	Transportation & Utilities	-	-	D	VD,VE
VE	Other	-	-	-	*

¹ The data in parentheses (66) identifies the year the field checking was conducted for the various inventories.

² The dash (-) indicates that there was no corresponding cover type mapped for the above inventories.

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⁴ The use of a code, such as the (A) footnoted, indicates that the code used for the above inventory corresponds to the 1988 standard cover types.

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APPENDIXES

APPENDIX A

Hydrologic Inventories

- Utah Lake Drainage Area. In cooperation with Utah State University. November 1969. 136 pages - includes substantial climatic, streamflow, and groundwater data, detailed water budgets, and more general information on water quality, geology, economy, history, and physiography.
- Uintah Study Unit. In cooperation with Utah State University. March 1970. 181 pages - includes substantial climatic, streamflow, and groundwater data, detailed water budgets, and more general information on topography, geology, arable lands, history, economy, water quality and water development and management. (out of print, file copy only)
- Weber River Study Unit. In cooperation with Utah State University. August 1970 - includes substantial climatic, streamflow and groundwater data, detailed water budgets, and more general information on topography, geology, economy, and water quality.
- Great Salt Lake Desert Area. In cooperation with Utah State University. November 1971. 70 pages - includes substantial climatic and water resources data, water budget for Tooele Valley, and more general information on physiography, economy, geology, and water management aspects.
- Bear River Study Unit. In cooperation with Utah State University. February 1973. 126 pages - includes substantial climatic, streamflow, and groundwater data, detailed water budgets, and more general information on water quality, topography, geology, and economy.
- Price River Study Unit. June 1975. Includes climatic, streamflow, and groundwater data, detailed water budgets, and more general information on water quality, topography, geology, and economy.
- Escalante River Study Unit. December 1976. Includes climatic, streamflow, and groundwater data, detailed water budgets, and more general information on water quality, topography, geology, and economy.
- Dirty Devil River Study Unit. January 1977. Includes climatic, streamflow, and groundwater data, detailed water budgets, and more general information on water quality, topography, geology, and economy.
- San Rafael River Study Unit. January 1977. Includes climatic, streamflow, and groundwater data, detailed water budgets, and more general information on water quality, topography, geology, and economy.

Update of the Price River Study Unit. June 1978. Includes updated climatic, streamflow, and water use data and detailed water budgets.

Update of the San Rafael River Study Unit. December 1979. Includes updated climatic, streamflow, and groundwater data, detailed water budgets, and more general information on water quality, topography, geology, and economy.

Virgin and Kanab Study Units (Utah's Lower Colorado River Area). February 1983. Includes climatic, streamflow, and groundwater data, detailed water budgets, and more general information on water quality, topography, geology, and economy.

Hydrologic Inventory of Colorado, Dolores, and San Juan Study Units. September 1987. Includes climatic, streamflow, and groundwater data, detailed water budgets, and more general information on water quality, topography, geology and economy.

Hydrologic Inventory of the Sevier River Basin. January 1991. Includes climatic, streamflow, and groundwater data, detailed water budgets, and more general information on water quality, topography, geology and economy.

APPENDIX B

In late 1984 at the beginning of Division of Water Resource's new phase of mapping water-related land use, an Active Mappers Committee was formed. The Division of Water Resources, Department of Natural Resource and The Division of Agriculture Development and Conservation, Department of Agriculture co-chaired this committee. Lloyd Austin, Division of Water Resources and Jim Christensen, Department of Agriculture filled these roles. Member agencies were:

- Automated Geographic Reference
- Bureau of Land Management
- Bureau of Reclamation
- Center of Remote Sensing, University of Utah
- Dept of Transportation
- Dept of Agriculture
- Dept of Natural Resource
- Dept of Health - Water Pollution
- Div of Water Resources
- Div of Water Rights
- Div of Wildlife Resource
- Soil Conservation Service
- State Lands and Forestry
- Utah Geological and Mineral Survey
- U.S. Fish and Wildlife
- U.S. Forest Service/Ogden
- U.S. Forest Service
- U.S. Geological Service
- Utah State University-Extension Service

The committee surveyed all ongoing mapping efforts and then focused on the issue of coordinating and standardizing map data. The relationships between several state agencies and the AGRC program of the Office of Planning and Budget were also clarified. Three specific products came from this committee's work. The first was a standardized definition of a base resource data map file as follows:

<u>Layers of Data</u>	<u>Level of Detail</u>
Infrastructure & Base	Map Quad Sheet (USGS Topo) 1:24,000 scale
Ownership	Federal/State/Private, input 1:250,000 scale
Soils	Level 3 definition with preferred input of 1:24,000 scale
Land Cover	Use standard legend and set preferred input 1:24,000 scale
Climate	Precipitation/Temperature 1:250,000 input scale

Secondly, a standard legend for a cover map was developed and agreed upon which allows a hierarchy of data entry. This is shown as Table 1. The headings which are marked with an asterisk were minimum required for the base data set. Individual agencies could use finer breakdowns as needed for their specific programs.

The Division of Water Resources used only certain categories in the Great Salt Lake Desert Study Unit mapping which were considered necessary for water use budgets being prepared. All range land and forest land categories were left off while some categories were subdivided further than required by the base data set standards.

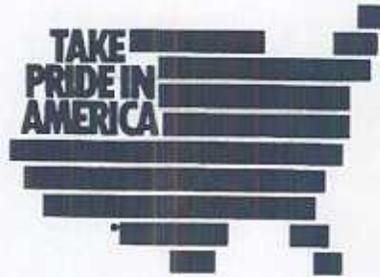
The third agreement reached by the committee was the use of a standard set of watershed units for the state. It was agreed that the maps developed by the United States Geological Survey working with National Water Resources Council would serve as the base standard. Individual agencies could then further subdivide these larger units for specific study purposes. This proposal was also presented to the Resource Development Coordinating Committee during the year 1986 and ratified.

APPENDIX C

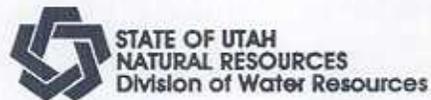
Water-Related Land Use Studies

- Utah Lake Drainage Area. In cooperation with Utah State University. February 1968 - detailed water-related land use tables and maps.
- Bear River Drainage Area. In cooperation with Utah State University. April 1969 - detailed water-related land use tables and maps.
- Weber River Drainage Area. In cooperation with Utah State University. February 1970 - detailed water-related land use tables and maps.
- Uinta Hydrologic Area. Staff Report No. 7. September 1971 - detailed water-related land use tables and maps.
- West Colorado Hydrologic Area. Staff Report No. 8. January 1972 - detailed water-related land use tables and maps.
- Uintah Basin. In cooperation with U.S. Soil Conservation Services and National Aeronautics and Space Administration. 1980. Contains detailed water-related land use maps and tables. Investigates the use of landsat data concurrently with the high altitude color infrared photography to update the changing patterns of land use. Performed under contract with the Center for Remote Sensing and Cartography of the University of Utah Research Institute. 109 pages plus maps.
- Sevier River Basin (Upper Portion), 1981. Contains detailed water-related land use maps and tables. Performed under contract with the Center for Remote Sensing and Cartography of the University of Utah Research Institute. 27 pages plus maps.
- Sevier River Basin (Lower Portion), 1985. Contains detailed water-related land use maps and tables.
- Salt Lake County, 1982. Contains detailed water related land use maps and tables. Performed under contract with the Center for Remote Sensing and Cartography of the University of Utah Research Institute. 24 pages plus maps.
- Sevier River Basin (Middle Portion), 1984. Contains detailed water-related land use maps and tables. Performed under contract with the Center for Remote Sensing and Cartography of the University of Utah Research Institute. 34 pages plus maps.
- Virgin River Area, 1989. Contains detailed water-related land use maps and tables. Performed in cooperation with USDA Soil Conservation Service, St. George, Utah office and Utah Division of Water Rights, Cedar City Area Office. 56 pages plus maps.

- Bear River Basin, 1991. Contains detailed water-related land use maps and tables. Performed in cooperation with Utah Division of Water Rights. 50 pages plus maps.
- Columbia River Basin (Utah portion), 1991. Contains detailed water-related land use maps and tables. 46 pages plus maps.
- Southeast Colorado Basin (Utah Portion), 1991. Contains detailed water-related land use maps and tables. 57 pages plus maps.
- Sevier River Basin, 1992. Contains detailed water-related land use maps and tables. 136 pages plus maps.
- Weber River Area, 1992. Contains detailed water-related land use maps and tables. 56 pages plus maps.
- Kanab Creek/Virgin River Study Units, 1992. Contains detailed water-related land use maps and tables. 58 pages plus maps.
- Cedar/Beaver Study Unit, 1993. Contains detailed water-related land use maps and tables. 46 pages plus maps.
- Utah Lake Study Area, 1993. Contains detailed water-related land use maps and tables. 60 pages plus maps.
- West Colorado Study Unit, 1993. Contains detailed water-related land use maps and tables. 68 pages plus maps.



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