

Table 4.2-53. Irrigation Water Use per Crop for the Region by State.

Crop	California <i>acre-foot</i>	Nevada <i>acre-foot</i>	Total <i>acre-foot</i>
Pasture	25,616	29,138	54,754
Alfalfa Hay	1,065	1,987	3,051
Other Hay	7,099	7,946	15,045
Barley	710	0	710
Total	34,489	39,071	73,560

Table 4.2-54. Livestock Water Requirements per Cow by State.

<i>Cow</i>	<i>California gallons / cow / day</i>	<i>Nevada gallons / cow / day</i>
Beef Cow	15	15
Dairy Cow	25	25
	<i>gallons / cow / year</i>	<i>gallons / cow / year</i>
Beef Cow	5,475	5,475
Dairy Cow	9,125	9,125
	<i>acre-feet / cow / year</i>	<i>acre-feet / cow / year</i>
Beef Cow	0.01680216	0.01680216
Dairy Cow	0.02800360	0.02800360

Table 4.2-55. Number of Cows for the Region by State.

<i>Cow</i>	<i>California cows</i>	<i>Nevada cows</i>	<i>Total cows</i>
Beef Cow	3,609	3,667	7,276
Dairy Cow	0	500	500

Table 4.2-56. Livestock Water Use per Cow for the Region by State.

<i>Cow</i>	<i>California acre-feet</i>	<i>Nevada acre-feet</i>	<i>Total acre-feet</i>
Beef Cow	61	62	122
Dairy Cow	0	14	14

Table 4.2-57. Agriculture Water Use by Economic Sector for the Region by State.

Economic Sector	California <i>acre-feet</i>	Nevada <i>acre-feet</i>	Total <i>acre-feet</i>
1 Livestock Production	25,676	29,200	54,876
2 Dairy Production	0	14	14
3 Alfalfa Hay Production	1,065	1,987	3,051
4 Other Hay Production	7,099	7,946	15,045
5 Barley Production	710	0	710
Total	34,550	39,147	73,696

Commercial Water Use

Commercial water use is the use of water for business purposes.

Commercial Water Use by Economic Sector

Data to estimate commercial water use was provided by the State of Nevada Department of Water Planning.

Commercial water use is analyzed in Tables 4.2-58 through 4.2-61. Commercial water requirements per employee by economic sector by state are provided in Tables 4.2-58 through 4.2-60. The difference among the tables is that the requirements are presented as gallons per employee per day, then again as gallons per employee per year, and then finally as acre-feet per employee per year. Using the requirements presented as acre-feet per employee per year, the employment by economic sector for the region by state given in Table 4.2-23 and measured in jobs are multiplied by the requirements to estimate the commercial water use by economic sector for the region by state in Table 4.2-61.

Commercial water use by economic sector for the region by state are shown in Table 4.2-61. Commercial water use for the region is 12,432 acre-feet. Of this amount, 1,084 acre-feet is in California and 11,348 acre-feet is in Nevada.

Table 4.2-58. Commercial Water Requirements per Employee by Economic Sector by State.

Economic Sector	California gallons / employee / day	Nevada gallons / employee / day
1 Livestock Production	42.72500000	42.72500000
2 Dairy Production	42.72500000	42.72500000
3 Alfalfa Hay Production	42.72500000	42.72500000
4 Other Hay Production	42.72500000	42.72500000
5 Barley Production	42.72500000	42.72500000
6 Agricultural Services	42.72500000	42.72500000
7 Gold Mining	9.78999893	9.78999893
8 Other Mining	10.62000537	10.62000537
9 Construction	17.01000004	17.01000004
10 Manufacturing	35.86999993	35.86999993
11 Transportation and Communications	28.57999993	28.57999993
12 Utilities	204.22000028	204.22000028
13 Trade	33.06000001	33.06000001
14 Eating, Drinking, and Lodging	96.18999995	96.18999995
15 Finance, Insurance, and Real Estate	19.51999992	19.51999992
16 Services	50.16000000	50.16000000
17 Hotels, Gaming, and Recreation	159.74999997	159.74999997
18 Health	75.11999991	75.11999991
19 Local Government	21.70999990	21.70999990
20 Households		

Table 4.2-59. Commercial Water Requirements per Employee by Economic Sector by State.

Economic Sector	California gallons / employee / year	Nevada gallons / employee / year
1 Livestock Production	15,595	15,595
2 Dairy Production	15,595	15,595
3 Alfalfa Hay Production	15,595	15,595
4 Other Hay Production	15,595	15,595
5 Barley Production	15,595	15,595
6 Agricultural Services	15,595	15,595
7 Gold Mining	3,573	3,573
8 Other Mining	3,876	3,876
9 Construction	6,209	6,209
10 Manufacturing	13,093	13,093
11 Transportation and Communications	10,432	10,432
12 Utilities	74,540	74,540
13 Trade	12,067	12,067
14 Eating, Drinking, and Lodging	35,109	35,109
15 Finance, Insurance, and Real Estate	7,125	7,125
16 Services	18,308	18,308
17 Hotels, Gaming, and Recreation	58,309	58,309
18 Health	27,419	27,419
19 Local Government	7,924	7,924
20 Households	0	0

Table 4.2-60. Commercial Water Requirements per Employee by Economic Sector by State.

Economic Sector	California acre-feet / employee / year	Nevada acre-feet / employee / year
1 Livestock Production	0.04785815	0.04785815
2 Dairy Production	0.04785815	0.04785815
3 Alfalfa Hay Production	0.04785815	0.04785815
4 Other Hay Production	0.04785815	0.04785815
5 Barley Production	0.04785815	0.04785815
6 Agricultural Services	0.04785815	0.04785815
7 Gold Mining	0.01096621	0.01096621
8 Other Mining	0.01189593	0.01189593
9 Construction	0.01905365	0.01905365
10 Manufacturing	0.04017956	0.04017956
11 Transportation and Communications	0.03201371	0.03201371
12 Utilities	0.22875578	0.22875578
13 Trade	0.03703196	0.03703196
14 Eating, Drinking, and Lodging	0.10774664	0.10774664
15 Finance, Insurance, and Real Estate	0.02186521	0.02186521
16 Services	0.05618642	0.05618642
17 Hotels, Gaming, and Recreation	0.17894298	0.17894298
18 Health	0.08414521	0.08414521
19 Local Government	0.02431832	0.02431832
20 Households	0.00000000	0.00000000

Table 4.2-61. Commercial Water Use by Economic Sector for the Region by State.

Economic Sector	California <i>acre-feet</i>	Nevada <i>acre-feet</i>	Total <i>acre-feet</i>
1 Livestock Production	1	2	3
2 Dairy Production	0	1	1
3 Alfalfa Hay Production	0	0	0
4 Other Hay Production	0	0	0
5 Barley Production	0	0	0
6 Agricultural Services	8	57	64
7 Gold Mining	0	17	17
8 Other Mining	0	2	2
9 Construction	52	187	239
10 Manufacturing	57	395	452
11 Transportation and Communications	16	263	279
12 Utilities	26	590	616
13 Trade	112	1,228	1,340
14 Eating, Drinking, and Lodging	155	423	577
15 Finance, Insurance, and Real Estate	46	295	341
16 Services	172	1,790	1,962
17 Hotels, Gaming, and Recreation	237	4,352	4,589
18 Health	155	1,490	1,644
19 Local Government	45	258	303
20 Households	0	0	0
Total	1,084	11,348	12,432

Residential Water Use

Residential water use is the use of water for household purposes, and the irrigation of lawns, gardens, and shrubbery surrounding a residence.

Residential Water Use by Economic Sector

Data to estimate residential water use was provided by Westpac Utilities.

Residential water use is analyzed in Tables 4.2-62 through 4.2-69. Residential water use is estimated by multiplying the residential water requirement per household in acre-feet by the distribution of households by type and by housing by economic sector for the region.

Residential water requirements per household by state are shown in Table 4.2-62. Requirements per household are 228,096 gallons per year for a family households, 162,926 gallons per year for a metered family household, and 97,755 gallons per year for both a non-family household and metered non-family household. In terms of acre-feet, the requirements per household are .70 acre-feet per year for a family household, .50 acre-feet per year for a metered family household, and .30 acre-feet per year for both a non-family household and metered non-family household. The distribution of households by type for the region by state is shown in Table 4.2-47. For California, of the total households, 74.37% are family households and 25.63% are non-family households. For Nevada, of the total households, 72.97% are family households and 27.03% are non-family households. The housing by economic sector is shown in Table 4.2-49. As mentioned earlier there are 18,452 occupied housing units with households in California and 103,787 occupied housing units with households in Nevada for a total of 122,239 occupied housing units with households for the region.

Residential water requirements for family households by economic sector for the region by state and residential water requirements for non-family households by economic sector for the region by state are shown in Tables 4.2-63 and 4.2-64. Then by combining these two, the residential water use by economic sector for the region by state is shown in Table 4.2-65.

Residential water use by economic sector for the region by state is shown in Table 4.2-65. Residential water use for the region is 72,453 acre-feet. Of this amount, 11,025 acre-feet is in California and 61,428 acre-feet is in Nevada.

Assuming that all residences have a water meter. Residential water requirements for metered family households by economic sector for the region by state and residential water requirements for metered non-family households by economic sector for the region by state are shown in Tables 4.2-66 and 4.2-67. Then by combining these two, the metered residential water use by economic sector for the region by state is shown in Table 4.2-68.

Metered residential water use by economic sector for the region by state is shown in Table 4.2-68. Metered residential water use for the region is 54,563 acre-feet. Of this amount, 8,280 acre-feet is in California and 46,282 acre-feet is in Nevada.

The ratio of metered residential water use to unmetered residential water use by economic sector for the region is shown in Table 4.2-69. The ratio for the region is .75 of an acre-foot of metered residential water use to 1.00 acre-foot of unmetered residential water use.

Table 4.2-62. Residential Water Requirements per Household by State.

Household	California	Nevada
	<i>gallons / household / year</i>	<i>gallons / household / year</i>
Family Household	228,096	228,096
Metered Family Household /1	162,926	162,926
Non-Family Household	97,755	97,755
Metered Non-Family Household /1	97,755	97,755
	<i>acre-feet / household / year</i>	<i>acre-feet / household / year</i>
Family Household	0.70000092	0.70000092
Metered Family Household /1	0.50000153	0.50000153
Non-Family Household	0.29999908	0.29999908
Metered Non-Family Household /1	0.29999908	0.29999908

1. A water meter is required for new residential construction.

Table 4.2-63. Residential Water Requirements for Family Households by Economic Sector for the Region by State.

Economic Sector	California <i>acre-feet</i>	Nevada <i>acre-feet</i>	Total <i>acre-feet</i>
1 Livestock Production	15	10	25
2 Dairy Production	0	7	7
3 Alfalfa Hay Production	1	1	2
4 Other Hay Production	2	2	4
5 Barley Production	0	0	0
6 Agricultural Services	80	373	452
7 Gold Mining	3	479	482
8 Other Mining	17	54	71
9 Construction	1,330	3,095	4,424
10 Manufacturing	699	3,090	3,788
11 Transportation and Communications	251	2,585	2,836
12 Utilities	57	811	868
13 Trade	1,475	10,434	11,908
14 Eating, Drinking, and Lodging	701	1,235	1,936
15 Finance, Insurance, and Real Estate	1,026	4,252	5,278
16 Services	1,497	10,027	11,524
17 Hotels, Gaming, and Recreation	647	7,652	8,300
18 Health	898	5,570	6,468
19 Local Government	908	3,335	4,244
20 Households	0	0	0
Total	9,606	53,012	62,618

Table 4.2-64. Residential Water Requirements for Non-Family Households by Economic Sector for the Region by State.

Economic Sector	California <i>acre-feet</i>	Nevada <i>acre-feet</i>	Total <i>acre-feet</i>
1 Livestock Production	2	2	4
2 Dairy Production	0	1	1
3 Alfalfa Hay Production	0	0	0
4 Other Hay Production	0	0	1
5 Barley Production	0	0	0
6 Agricultural Services	12	59	71
7 Gold Mining	0	76	77
8 Other Mining	2	9	11
9 Construction	196	491	688
10 Manufacturing	103	491	594
11 Transportation and Communications	37	410	448
12 Utilities	8	129	137
13 Trade	218	1,657	1,874
14 Eating, Drinking, and Lodging	103	196	300
15 Finance, Insurance, and Real Estate	151	675	827
16 Services	221	1,592	1,813
17 Hotels, Gaming, and Recreation	96	1,215	1,311
18 Health	133	884	1,017
19 Local Government	134	530	664
20 Households	0	0	0
Total	1,419	8,417	9,835

Table 4.2-65. Residential Water Use by Economic Sector for the Region by State.

Economic Sector	California acre-feet	Nevada acre-feet	Total acre-feet
1 Livestock Production	17	12	29
2 Dairy Production	0	8	8
3 Alfalfa Hay Production	1	1	3
4 Other Hay Production	3	2	5
5 Barley Production	1	0	1
6 Agricultural Services	92	432	523
7 Gold Mining	4	555	559
8 Other Mining	19	63	82
9 Construction	1,526	3,586	5,112
10 Manufacturing	802	3,580	4,382
11 Transportation and Communications	288	2,995	3,284
12 Utilities	65	940	1,005
13 Trade	1,692	12,090	13,783
14 Eating, Drinking, and Lodging	804	1,431	2,235
15 Finance, Insurance, and Real Estate	1,177	4,928	6,105
16 Services	1,718	11,619	13,337
17 Hotels, Gaming, and Recreation	743	8,867	9,610
18 Health	1,030	6,455	7,485
19 Local Government	1,042	3,865	4,907
20 Households	0	0	0
Total	11,025	61,428	72,453

Table 4.2-66. Residential Water Requirements for Metered Family Households by Economic Sector for the Region by State.

Economic Sector	California <i>acre-feet</i>	Nevada <i>acre-feet</i>	Total <i>acre-feet</i>
1 Livestock Production	11	7	18
2 Dairy Production	0	5	5
3 Alfalfa Hay Production	1	1	2
4 Other Hay Production	2	1	3
5 Barley Production	0	0	0
6 Agricultural Services	57	266	323
7 Gold Mining	2	342	344
8 Other Mining	12	39	51
9 Construction	950	2,210	3,160
10 Manufacturing	499	2,207	2,706
11 Transportation and Communications	179	1,846	2,026
12 Utilities	40	579	620
13 Trade	1,053	7,453	8,506
14 Eating, Drinking, and Lodging	501	882	1,383
15 Finance, Insurance, and Real Estate	733	3,037	3,770
16 Services	1,069	7,162	8,231
17 Hotels, Gaming, and Recreation	462	5,466	5,928
18 Health	641	3,979	4,620
19 Local Government	649	2,382	3,031
20 Households	0	0	0
Total	6,862	37,866	44,727

Table 4.2-67. Residential Water Requirements for Metered Non-Family Households by Economic Sector for the Region by State.

Economic Sector	California <i>acre-feet</i>	Nevada <i>acre-feet</i>	Total <i>acre-feet</i>
1 Livestock Production	2	2	4
2 Dairy Production	0	1	1
3 Alfalfa Hay Production	0	0	0
4 Other Hay Production	0	0	1
5 Barley Production	0	0	0
6 Agricultural Services	12	59	71
7 Gold Mining	0	76	77
8 Other Mining	2	9	11
9 Construction	196	491	688
10 Manufacturing	103	491	594
11 Transportation and Communications	37	410	448
12 Utilities	8	129	137
13 Trade	218	1,657	1,874
14 Eating, Drinking, and Lodging	103	196	300
15 Finance, Insurance, and Real Estate	151	675	827
16 Services	221	1,592	1,813
17 Hotels, Gaming, and Recreation	96	1,215	1,311
18 Health	133	884	1,017
19 Local Government	134	530	664
20 Households	0	0	0
Total	1,419	8,417	9,835

Table 4.2-68. Metered Residential Water Use by Economic Sector for the Region by State.

Economic Sector	California <i>acre-feet</i>	Nevada <i>acre-feet</i>	Total <i>acre-feet</i>
1 Livestock Production	13	9	22
2 Dairy Production	0	6	6
3 Alfalfa Hay Production	1	1	2
4 Other Hay Production	2	1	3
5 Barley Production	0	0	0
6 Agricultural Services	69	325	394
7 Gold Mining	3	418	421
8 Other Mining	14	47	62
9 Construction	1,146	2,702	3,848
10 Manufacturing	602	2,697	3,300
11 Transportation and Communications	216	2,257	2,473
12 Utilities	49	708	757
13 Trade	1,271	9,109	10,380
14 Eating, Drinking, and Lodging	604	1,078	1,682
15 Finance, Insurance, and Real Estate	884	3,713	4,597
16 Services	1,290	8,754	10,044
17 Hotels, Gaming, and Recreation	558	6,681	7,239
18 Health	774	4,863	5,637
19 Local Government	783	2,912	3,695
20 Households	0	0	0
Total	8,280	46,282	54,563

Table 4.2-69. Ratio of Metered Residential Water Use to Residential Water Use by Economic Sector for the Region.

Economic Sector	Metered Residential Water Use acre-feet	Residential Water Use acre-feet	Ratio
1 Livestock Production	22	29	0.75200932
2 Dairy Production	6	8	0.75343453
3 Alfalfa Hay Production	2	3	0.75239916
4 Other Hay Production	3	5	0.75199120
5 Barley Production	0	1	0.75105275
6 Agricultural Services	394	523	0.75301781
7 Gold Mining	421	559	0.75341844
8 Other Mining	62	82	0.75287559
9 Construction	3,848	5,112	0.75272351
10 Manufacturing	3,300	4,382	0.75299870
11 Transportation and Communications	2,473	3,284	0.75322548
12 Utilities	757	1,005	0.75328062
13 Trade	10,380	13,783	0.75314206
14 Eating, Drinking, and Lodging	1,682	2,235	0.75257762
15 Finance, Insurance, and Real Estate	4,597	6,105	0.75297530
16 Services	10,044	13,337	0.75312774
17 Hotels, Gaming, and Recreation	7,239	9,610	0.75325038
18 Health	5,637	7,485	0.75310663
19 Local Government	3,695	4,907	0.75292857
20 Households	0	0	
Total	54,563	72,453	0.75307210

Output Response Coefficients

Output response coefficients represent the unit change in employment, income, population, housing, agriculture water use, commercial water use, and residential water use from a one dollar change in output.

Output Response Coefficients by Economic Sector

Control totals by economic sector for the region are shown in Table 4.2-70. The output response is read across the columns for each sector.

For the region, output is \$17,857,271,279. Employment is 188,121 jobs. Income is \$6,720,549,054. Population is 307,874 persons. Housing is 122,239 dwellings. Agriculture water use is 73,696 acre-feet. Commercial water use is 12,432 acre-feet. Residential water use is 72,453 acre-feet.

Output response coefficients by economic sector for the region are shown in Table 4.2-71. These are calculated by dividing employment, income, population, housing, agriculture water use, commercial water use, and residential water use by output. Employment is interpreted as jobs per dollar of output. Income is interpreted as dollars per dollar of output. Population is interpreted as persons per dollar of output. Housing is interpreted as dwellings per dollar of output. Agriculture water use, commercial water use and residential water use are interpreted as acre-feet per dollar of output.

Table 4.2-70. Control Totals by Economic Sector for the Region.

Economic Sector	Output	Employment	Income	Population	Housing	Agriculture Water Use	Commercial Water Use	Residential Water Use
	\$	jobs	\$	all persons	dwellings	acre-feet	acre-feet	acre-feet
1 Livestock Production	3,339,455	63	540,275	126	49	54,876	3	29
2 Dairy Production	960,000	21	216,000	32	13	14	1	8
3 Alfalfa Hay Production	320,000	6	130,000	11	4	3,051	0	3
4 Other Hay Production	560,000	10	212,000	20	8	15,045	0	5
5 Barley Production	36,000	1	11,000	2	1	710	0	1
6 Agricultural Services	52,687,679	1,347	22,287,864	2,227	883	0	64	523
7 Gold Mining	53,214,316	1,529	16,611,099	2,355	944	0	17	559
8 Other Mining	12,872,113	206	3,349,029	350	138	0	2	82
9 Construction	1,440,667,287	12,555	415,700,525	21,894	8,613	0	239	5,112
10 Manufacturing	1,363,431,322	11,248	359,523,876	18,652	7,391	0	452	4,382
11 Transportation and Communications	739,238,624	8,729	296,464,250	13,904	5,543	0	279	3,284
12 Utilities	430,242,000	2,693	53,970,125	4,249	1,696	0	616	1,005
13 Trade	1,433,846,375	36,174	698,140,670	58,474	23,260	0	1,340	13,783
14 Eating, Drinking, and Lodging	284,306,597	5,359	94,861,199	9,605	3,764	0	577	2,235
15 Finance, Insurance, and Real Estate	1,381,758,827	15,612	191,672,157	25,997	10,295	0	341	6,105
16 Services	1,207,179,719	34,927	478,662,078	56,600	22,506	0	1,962	13,337
17 Hotels, Gaming, and Recreation	1,361,938,251	25,643	439,634,081	40,672	16,226	0	4,589	9,610
18 Health	665,890,740	19,539	281,216,735	31,782	12,630	0	1,644	7,485
19 Local Government	704,232,921	12,458	261,331,681	20,921	8,275	0	303	4,907
20 Households	6,720,549,054	0	3,106,014,408	0	0	0	0	0
Total	17,857,271,279	188,121	6,720,549,054	307,874	122,239	73,696	12,432	72,453

Table 4.2-71. Output Response Coefficients by Economic Sector for the Region.

Economic Sector	Output	Employment	Income	Population	Housing	Agriculture Water Use	Commercial Water Use	Residential Water Use
	\$	jobs / \$ of output	\$ / \$ of output	all persons / \$ of output	dwellings / \$ of output	acre-feet / \$ of output	acre-feet / \$ of output	acre-feet / \$ of output
1 Livestock Production	1.00000000	0.00001887	0.16178555	0.00003786	0.00001462	0.01643270	0.00000090	0.00000870
2 Dairy Production	1.00000000	0.00002188	0.22500000	0.00003362	0.00001348	0.00001459	0.00000105	0.00000798
3 Alfalfa Hay Production	1.00000000	0.00001875	0.40625000	0.00003479	0.00001357	0.00953541	0.00000090	0.00000806
4 Other Hay Production	1.00000000	0.00001786	0.37857143	0.00003597	0.00001388	0.02686571	0.00000085	0.00000826
5 Barley Production	1.00000000	0.00002778	0.30555556	0.00006923	0.00002607	0.01971859	0.00000133	0.00001558
6 Agricultural Services	1.00000000	0.00002557	0.42301852	0.00004226	0.00001676	0.00000000	0.00000122	0.00000993
7 Gold Mining	1.00000000	0.00002873	0.31215470	0.00004426	0.00001774	0.00000000	0.00000032	0.00001050
8 Other Mining	1.00000000	0.00001604	0.26017713	0.00002719	0.00001074	0.00000000	0.00000019	0.00000637
9 Construction	1.00000000	0.00000871	0.28854721	0.00001520	0.00000598	0.00000000	0.00000017	0.00000355
10 Manufacturing	1.00000000	0.00000825	0.26369049	0.00001368	0.00000542	0.00000000	0.00000033	0.00000321
11 Transportation and Communications	1.00000000	0.00001181	0.40103999	0.00001881	0.00000750	0.00000000	0.00000038	0.00000444
12 Utilities	1.00000000	0.00000626	0.12544132	0.00000988	0.00000394	0.00000000	0.00000143	0.00000234
13 Trade	1.00000000	0.00002523	0.48690061	0.00004078	0.00001622	0.00000000	0.00000093	0.00000961
14 Eating, Drinking, and Lodging	1.00000000	0.00001885	0.33365810	0.00003378	0.00001324	0.00000000	0.00000203	0.00000786
15 Finance, Insurance, and Real Estate	1.00000000	0.00001130	0.13871607	0.00001881	0.00000745	0.00000000	0.00000025	0.00000442
16 Services	1.00000000	0.00002893	0.39651269	0.00004689	0.00001864	0.00000000	0.00000163	0.00001105
17 Hotels, Gaming, and Recreation	1.00000000	0.00001883	0.32280030	0.00002986	0.00001191	0.00000000	0.00000337	0.00000706
18 Health	1.00000000	0.00002934	0.42231663	0.00004773	0.00001897	0.00000000	0.00000247	0.00001124
19 Local Government	1.00000000	0.00001769	0.37108700	0.00002971	0.00001175	0.00000000	0.00000043	0.00000697
20 Households	1.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000

Water Transfer Coefficients

Water transfer coefficients for agriculture water use are the proportions of agriculture water use in the agriculture sectors. Water transfer coefficients for commercial water use are the proportions of commercial water use in the non-agriculture sectors or commercial sectors.

Water Transfer Coefficients by Economic Sector

Water transfer coefficients by economic sector for the region are shown in Table 4.2-72. The agriculture water transfer coefficients are based on adjusted agriculture water use and the commercial water transfer coefficients are based on adjusted commercial water use. Adjusted agriculture water use reflects assignment of only the livestock production sector. Adjusted commercial water use reflects assignment of only the manufacturing, and, hotels, gaming, and recreation sectors. The water transfer coefficients are calculated by dividing the amount of water use in each of the assigned sectors by the total amount of water use for all the assigned sectors.

Table 4.2-72. Water Transfer Coefficients by Economic Sector for the Region.

Economic Sector	Agriculture Water Use <i>acre-feet</i>	Adjusted /1 Agriculture Water Use <i>acre-feet</i>	Agriculture Water Transfer Coefficient	Commercial Water Use <i>acre-feet</i>	Adjusted /2 Commercial Water Use <i>acre-feet</i>	Commercial Water Transfer Coefficient
1 Livestock Production	54,876	54,876	1.00000000	3	0	0.00000000
2 Dairy Production	14	0	0.00000000	1	0	0.00000000
3 Alfalfa Hay Production	3,051	0	0.00000000	0	0	0.00000000
4 Other Hay Production	15,045	0	0.00000000	0	0	0.00000000
5 Barley Production	710	0	0.00000000	0	0	0.00000000
6 Agricultural Services	0	0	0.00000000	64	0	0.00000000
7 Gold Mining	0	0	0.00000000	17	0	0.00000000
8 Other Mining	0	0	0.00000000	2	0	0.00000000
9 Construction	0	0	0.00000000	239	0	0.00000000
10 Manufacturing	0	0	0.00000000	452	452	0.08966279
11 Transportation and Communications	0	0	0.00000000	279	0	0.00000000
12 Utilities	0	0	0.00000000	616	0	0.00000000
13 Trade	0	0	0.00000000	1,340	0	0.00000000
14 Eating, Drinking, and Lodging	0	0	0.00000000	577	0	0.00000000
15 Finance, Insurance, and Real Estate	0	0	0.00000000	341	0	0.00000000
16 Services	0	0	0.00000000	1,962	0	0.00000000
17 Hotels, Gaming, and Recreation	0	0	0.00000000	4,589	4,589	0.91033721
18 Health	0	0	0.00000000	1,644	0	0.00000000
19 Local Government	0	0	0.00000000	303	0	0.00000000
20 Households	0	0	0.00000000	0	0	0.00000000
Total	73,696	54,876	1.00000000	12,432	5,041	1.00000000

1. Adjusted agriculture water use reflects assignment of only the livestock production sector.
2. Adjusted commercial water use reflects assignment of only the manufacturing sector, and, the hotel, gaming, and recreation sector (i.e., casino gaming industry).

4.3. Derivation of the Model Tables

Input-output tables include a transactions matrix, direct requirements, final demand requirements, output requirements, employment requirements, income requirements, and multipliers. Derivation of these tables is done using input-output procedures.

Transactions Matrix

There are twenty economic sectors within the economy of the region. Each sector is listed above with a definition in Table 4.1-15. These sectors include livestock production, dairy production, alfalfa hay production, other hay production, barley production, agricultural services, gold mining, other mining, construction, manufacturing, transportation and communications, utilities, trade, eating, drinking, and lodging, finance, insurance, and real estate, services, hotels, gaming, and recreation, health, local government, and households. The economic activity of these twenty sectors is accounted for in a transactions matrix.

A transactions matrix is a double entry accounting system. All transactions that a economic sector has within the economy are accounted for in the transactions matrix. There is an individual row and column for each sector in the matrix. Row entries represent output and include sales, other final demand, and exports by a sector. Other final demand are capital formation, inventory accumulation, state government purchases, and federal government purchases. Column entries, on the other hand, represent input and include purchases, other final payments, and imports by a sector. Other final payments are depreciation, expenditures to state government, and expenditures to federal government. The accounting identity of the matrix requires that for any sector the row total must equal the column total.

The transactions matrix for the region is shown in Table 4.3-1. Direction of entries for the matrix is across the row for output and down the column for input. The titles of the economic sectors are listed across the top and down the left side. Sectors across the top are purchasing sectors and sectors down the side are selling sectors.

The transactions matrix has four quadrants. These are outlined within the matrix in the following manner. In the top left corner of the matrix is Quadrant I. Quadrant I contains purchases and sales by sector. This quadrant is closed to the local government and households sectors in the matrix. Quadrant II is in the top right corner of the matrix and contains other final demand and exports by sector. In the bottom left corner of the matrix is Quadrant III. Quadrant III contains other final payments and imports by sector. Quadrant IV is in the bottom right corner of the matrix and contains transactions not directly linked to the other quadrants. Row totals of the sectors are on the right side and column totals of the sectors are across the bottom.

In matrix algebra notation, all entries in the transactions matrix are denoted as x_{ij} 's. Where x is the value of the intersector transaction for row sector i and column sector j . All entries include sales, other final demand, exports, purchases, other final payments, and imports. Row totals are denoted as X_i 's. Where X is the total value of output for row sector i . Column totals are denoted as X_j 's. Where X is the total value of

input for column sector j. Again the accounting identity requires that row sector output must be equal to column sector input or if $i = j$ then, $X_i = X_j$.

The transactions matrix is represented by the T matrix presented below.

$$\begin{array}{rcccccccc}
 T = & & x_{11} & + & x_{12} & + & \cdot & + & x_{1n} & = & X_1 & (4.3-1) \\
 & + & x_{21} & + & x_{22} & + & \cdot & + & x_{2n} & = & X_2 \\
 & & \cdot \\
 & & \cdot \\
 & + & x_{n1} & + & x_{n2} & + & \cdot & + & x_{nn} & = & X_n \\
 & = & X_1 & & X_2 & & \cdot & & X_n & & \cdot
 \end{array}$$

The dimensions of the T matrix include Quadrants I, II, III and IV.

Three assumptions are imposed on the transactions matrix. The first assumption is that individual businesses which make-up the economy can be grouped together into economic sectors. The reasoning here is that businesses in a given sector will be affected similarly by a given change. The second assumption is that all businesses in a given sector produce homogeneous products and services. The third assumption is that purchases of products and services by businesses in a sector from businesses in other sectors represent linear production functions. This last assumption is the assumption of fixed proportionality.

The transactions matrix for the region is based on the transactions matrix for Washoe county. The reason for this is because Washoe county makes-up 80% of the population base and 85% of the economic activity in the region.

The transactions matrix was derived in three steps. First, a transactions matrix for Washoe county was developed using IMPLAN. Second, the matrix was balanced to the output control totals mentioned above using a modified RAS technique. Third, the production functions were verified from a survey of businesses in selected sectors within the region. Particular attention was given to the hotel, gaming, and recreation sector since this sector is a large sector within the region.

Table 4.3-1. Transactions Matrix for the Region.

Economic Sector	1 Livestock Production	2 Dairy Production	3 Alfalfa Hay Production	4 Other Hay Production	5 Barley Production	6 Agricultural Services	7 Gold Mining	8 Other Mining	9 Construction
	\$	\$	\$	\$	\$	\$	\$	\$	\$
1 Livestock Production	705,119	0	0	0	0	0	0	0	0
2 Dairy Production	748	948	0	0	0	0	0	0	0
3 Alfalfa Hay Production	0	68,000	0	0	0	0	0	0	0
4 Other Hay Production	294,983	0	0	0	0	0	0	0	0
5 Barley Production	2,032	0	0	0	0	0	0	0	0
6 Agricultural Services	49,690	3,000	24,000	5,000	0	89,999	11,000	0	1,729,006
7 Gold Mining	0	0	0	0	0	94,999	0	11,000	0
8 Other Mining	0	0	0	0	0	3,000	3,000	16,000	9,000
9 Construction	27,084	8,353	0	0	0	476,108	251,514	558,716	210,284,091
10 Manufacturing	92,281	51,000	0	13,000	1,000	2,063,987	1,820,011	93,001	72,445,266
11 Transportation and Communications	29,971	17,000	0	4,000	0	641,996	690,004	77,001	14,189,052
12 Utilities	16,563	8,000	7,000	7,000	0	484,997	2,994,018	772,007	6,858,025
13 Trade	118,309	19,000	18,000	29,000	3,000	721,996	101,001	197,002	71,995,264
14 Eating, Drinking, and Lodging	0	0	0	0	0	0	213,001	0	0
15 Finance, Insurance, and Real Estate	128,562	37,000	20,000	35,000	2,000	1,126,993	2,920,017	263,002	33,129,122
16 Services	28,394	8,000	27,000	7,000	0	1,441,991	2,802,017	334,003	46,805,172
17 Hotels, Gaming, and Recreation	0	0	0	0	0	0	0	0	0
18 Health	0	0	0	0	0	0	0	5,000	0
19 Local Government	71,774	10,000	12,000	33,000	0	1,178,993	895,005	287,002	11,820,043
20 Households	540,276	216,000	130,000	212,000	11,000	22,287,864	16,611,099	3,349,029	415,700,526
Other Final Payments	115,154	74,000	23,000	35,000	4,000	11,468,930	8,861,053	3,371,030	160,160,588
Imports	1,118,515	439,699	59,000	180,000	15,000	10,605,826	15,041,576	3,568,320	395,542,132
Column Total	3,339,455	960,000	320,000	560,000	36,000	52,687,679	53,214,316	12,872,113	1,440,667,287

Table 4.3-1. Transactions Matrix (continue).

	10 Manufacturing	11 Transportation and Communications	12 Utilities	13 Trade	14 Eating, Drinking, and Lodging	15 Finance, Insurance, and Real Estate	16 Services	17 Hotels, Gaming, and Recreation	18 Health	19 Local Government	20 Households
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
1	1,294,003	0	0	0	0	0	24,000	0	0	0	426,808
2	880,842	0	0	0	0	0	4,741	0	0	0	6,373
3	10,000	0	0	0	0	0	0	0	0	0	151,231
4	0	0	0	0	0	0	0	0	0	0	185,958
5	7,086	0	0	0	0	0	12,884	0	0	0	0
6	80,000	14,000	21,000	85,000	0	6,099,999	73,000	0	0	0	249,811
7	2,277,006	0	0	0	0	0	0	0	0	0	0
8	2,908,007	0	19,000	0	0	0	1,000	0	17,000	0	5,601
9	11,952,923	14,845,768	16,107,998	9,047,975	1,510,008	62,306,505	21,348,015	1,329,028	6,452,111	48,422,620	21,665,814
10	103,934,253	9,536,008	4,328,010	22,536,022	5,239,011	8,151,999	14,470,033	24,625,005	13,636,036	4,068,358	108,396,820
11	29,260,071	30,585,026	6,183,014	27,299,026	2,139,004	12,423,998	21,944,049	9,597,002	8,310,022	4,899,054	137,867,832
12	32,842,080	3,640,003	45,055,105	32,518,031	11,435,024	15,132,998	22,480,051	24,309,004	9,709,025	12,952,602	125,074,805
13	18,952,046	3,113,003	271,001	2,923,003	15,443,032	2,551,000	8,025,018	11,276,002	11,379,030	14,618,887	553,004,922
14	0	7,902,007	526,001	11,013,011	0	10,112,999	19,679,044	0	0	0	193,521,981
15	18,011,044	13,372,011	3,243,008	77,102,074	8,892,019	149,480,981	42,926,097	5,896,001	36,889,096	15,781,275	495,995,295
16	36,104,088	36,125,030	3,356,008	75,159,072	6,214,013	40,721,995	82,389,186	23,058,004	32,953,086	20,998,323	654,674,760
17	0	0	0	0	0	0	0	59,173,011	0	0	199,381,904
18	115,000	0	0	0	0	997,000	2,076,005	42,375,008	31,602,083	1,475,489	407,323,486
19	8,723,021	3,412,003	2,667,006	8,184,008	1,795,004	12,138,998	6,336,014	50,267,009	4,227,011	123,408,808	164,776,878
20	359,523,876	296,464,250	53,970,125	698,140,669	94,861,199	191,672,157	478,662,078	439,634,081	281,216,735	261,331,681	6,487,252
	153,973,375	197,913,167	135,016,314	346,642,332	36,147,076	685,221,914	276,060,622	555,442,102	55,240,144	27,622,368	1,146,671,954
	582,582,601	122,316,348	159,478,410	123,196,152	100,631,207	184,746,284	210,667,882	114,956,994	174,259,361	168,653,456	2,504,679,569
	1,363,431,322	739,238,624	430,242,000	1,433,846,375	284,306,597	1,381,758,827	1,207,179,719	1,361,938,251	665,890,740	704,232,921	6,720,549,054

Table 4.3-1. Transactions Matrix (continue).

	Other Final Demand	Exports	Row Total
	\$	\$	\$
1	12,620	876,905	3,339,455
2	0	66,348	960,000
3	0	90,769	320,000
4	1,000	78,059	560,000
5	0	13,998	36,000
6	0	44,153,174	52,687,679
7	0	50,831,311	53,214,316
8	317,003	9,573,502	12,872,113
9	837,936,291	176,136,365	1,440,667,287
10	118,513,289	849,416,932	1,363,431,322
11	88,313,075	344,768,427	739,238,624
12	33,858,079	50,087,583	430,242,000
13	11,349,011	707,737,848	1,433,846,375
14	1,324,003	40,014,550	284,306,597
15	0	476,508,230	1,381,758,827
16	17,971,040	126,001,537	1,207,179,719
17	15,289,003	1,088,094,333	1,361,938,251
18	3,308,009	176,613,660	665,890,740
19	7,528,125	296,491,219	704,232,921
20	1,089,550,304	2,009,976,853	6,720,549,054
	N.A.	N.A.	N.A.
	N.A.	N.A.	N.A.
	N.A.	N.A.	N.A.

Direct Requirements

Direct requirements are the fixed combinations of inputs required for production of outputs. The fixed combinations of inputs represent linear production functions.

Direct requirements are shown in Table 4.3-2. These requirements are derived by dividing the column entries in Quadrant I and III of the T matrix by their respective column totals.

Direct requirements show the dollar amount of purchases made from a row sector by a column sector in order for that column sector to produce one dollar of output. These requirements are also known as technical coefficients of production or simply technical coefficients.

In matrix algebra notation, the direct requirements are denoted as a_{ij} 's. Where a is the dollar amount of purchases made from row sector i by column sector j in order for column sector j to produce one dollar of output. These are calculated by dividing the x_{ij} 's by the X_j 's of the T matrix. Where x_{ij} is the transactions value for the row sector i and column sector j and X_j is the total for column j .

The direct requirements are represented by the A matrix presented below.

$$\begin{array}{rcccccl} A = & & a_{11} & a_{12} & \cdot & a_{1n} & \\ & + & a_{21} & a_{22} & \cdot & a_{2n} & \\ & & \cdot & \cdot & \cdot & \cdot & \\ & & \cdot & \cdot & \cdot & \cdot & \\ & & \cdot & \cdot & \cdot & \cdot & \\ & + & a_{n1} & a_{n2} & \cdot & a_{nn} & \\ & = & 1.0 & 1.0 & \cdot & 1.0 & \end{array} \quad (4.3-2)$$

The dimensions of the A matrix include both Quadrants I and III.

Table 4.3-2. Direct Requirements.

Economic Sector	1 Livestock Production	2 Dairy Production	3 Alfalfa Hay Production	4 Other Hay Production	5 Barley Production	6 Agricultural Services	7 Gold Mining	8 Other Mining	9 Construction
1 Livestock Production	0.21114793	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
2 Dairy Production	0.00022399	0.00098750	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
3 Alfalfa Hay Production	0.00000000	0.07083333	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
4 Other Hay Production	0.08833268	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
5 Barley Production	0.00060848	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
6 Agricultural Services	0.01487967	0.00312500	0.07500000	0.00892857	0.00000000	0.00170816	0.00020671	0.00000000	0.00120014
7 Gold Mining	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00180306	0.00000000	0.00085456	0.00000000
8 Other Mining	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00005694	0.00005638	0.00124300	0.00000625
9 Construction	0.00811031	0.00870104	0.00000000	0.00000000	0.00000000	0.00903642	0.00472643	0.04340515	0.14596298
10 Manufacturing	0.02763355	0.05312500	0.00000000	0.02321429	0.02777778	0.03917400	0.03420153	0.00722500	0.05028591
11 Transportation and Communications	0.00897482	0.01770833	0.00000000	0.00714286	0.00000000	0.01218494	0.01296651	0.00598200	0.00984894
12 Utilities	0.00495979	0.00833333	0.02187500	0.01250000	0.00000000	0.00920513	0.05626339	0.05997516	0.00476031
13 Trade	0.03542764	0.01979167	0.05625000	0.05178571	0.08333333	0.01370332	0.00189800	0.01530456	0.04997355
14 Eating, Drinking, and Lodging	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00400270	0.00000000	0.00000000
15 Finance, Insurance, and Real Estate	0.03849790	0.03854167	0.06250000	0.06250000	0.05555556	0.02139007	0.05487277	0.02043192	0.02299568
16 Services	0.00850259	0.00833333	0.08437500	0.01250000	0.00000000	0.02736866	0.05265532	0.02594780	0.03248854
17 Hotels, Gaming, and Recreation	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
18 Health	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00038844	0.00000000
19 Local Government	0.02149273	0.01041667	0.03750000	0.05892857	0.00000000	0.02237702	0.01681888	0.01996580	0.00820456
20 Households	0.16178568	0.22500000	0.40625000	0.37857143	0.30555556	0.42301852	0.31215470	0.26017710	0.28854721
Other Final Payments	0.03448287	0.07708333	0.07187500	0.06250000	0.11111111	0.21767765	0.16651634	0.26188630	0.11117111
Imports	0.33493938	0.45801979	0.18437500	0.32142857	0.41666667	0.20129613	0.28266033	0.27721323	0.27455481
Column Total	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000

Table 4.3-2. Direct Requirements (continue).

	10 Manufacturing	11 Transportation and Communications	12 Utilities	13 Trade	14 Eating, Drinking, and Lodging	15 Finance, Insurance, and Real Estate	16 Services	17 Hotels, Gaming, and Recreation	18 Health	19 Local Government	20 Households
1	0.00094908	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00001988	0.00000000	0.00000000	0.00000000	0.00006351
2	0.00064605	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000393	0.00000000	0.00000000	0.00000000	0.00000095
3	0.00000733	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00002250
4	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00002767
5	0.00000520	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00001067	0.00000000	0.00000000	0.00000000	0.00000000
6	0.00005868	0.00001894	0.00004881	0.00005928	0.00000000	0.00441466	0.00006047	0.00000000	0.00000000	0.00000000	0.00003717
7	0.00167006	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
8	0.00213286	0.00000000	0.00004416	0.00000000	0.00000000	0.00000000	0.00000083	0.00000000	0.00002553	0.00000000	0.00000083
9	0.00876680	0.02008251	0.03743939	0.00631028	0.00531120	0.04509217	0.01768421	0.00097584	0.00968944	0.06875938	0.00322382
10	0.07622991	0.01289977	0.01005948	0.01571718	0.01842733	0.00589973	0.01198664	0.01808085	0.02047789	0.00577701	0.01612916
11	0.02146061	0.04137369	0.01437101	0.01903902	0.00752358	0.00899144	0.01817795	0.00704658	0.01247956	0.00695658	0.02051437
12	0.02408781	0.00492399	0.10472038	0.02267888	0.04022075	0.01095198	0.01862196	0.01784883	0.01458051	0.01839250	0.01861080
13	0.01390026	0.00421109	0.00062988	0.00203857	0.05431823	0.00184620	0.00664774	0.00827938	0.01708843	0.02075860	0.08228568
14	0.00000000	0.01068939	0.00122257	0.00768075	0.00000000	0.00731893	0.01630167	0.00000000	0.00000000	0.00000000	0.02879556
15	0.01321009	0.01808890	0.00753764	0.05377290	0.03127616	0.10818167	0.03555899	0.00432913	0.05539812	0.02240917	0.07380279
16	0.02648031	0.04886789	0.00780028	0.05241780	0.02185673	0.02947113	0.06824931	0.01693029	0.04948723	0.02981730	0.09741388
17	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.04344765	0.00000000	0.00000000	0.02966750
18	0.00008435	0.00000000	0.00000000	0.00000000	0.00000000	0.00072154	0.00171971	0.03111375	0.04745836	0.00209517	0.06060866
19	0.00639784	0.00461556	0.00619885	0.00570773	0.00631362	0.00878518	0.00524861	0.03690843	0.00634790	0.17523862	0.02451837
20	0.26369049	0.40103999	0.12544132	0.48690061	0.33365810	0.13871607	0.39651269	0.32280030	0.42231663	0.37108700	0.00096529
	0.11293079	0.26772569	0.31381482	0.24175695	0.12714118	0.49590558	0.22868229	0.40783207	0.08295677	0.03922334	0.17062177
	0.42729149	0.16546260	0.37067141	0.08592005	0.35395312	0.13370371	0.17451244	0.08440691	0.26169362	0.23948533	0.37268972
	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000

Final Demand Requirements

Final demand requirements measure the change in total economic activity from a change in final demand. Final demand includes capital formation, inventory accumulation, state government purchases, federal government purchases, and exports.

A identity matrix and a $I - A$ matrix are necessary to calculate the final demand requirements.

The identity matrix is shown in Table 4.3-3. The identity matrix has one's placed along the main diagonal and zero's placed in other locations.

In matrix algebra notation, the identity matrix is represented by the I matrix presented below.

$$I = \begin{matrix} 1.0 & 0.0 & \cdot & 0.0 \\ 0.0 & 1.0 & \cdot & 0.0 \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ 0.0 & 0.0 & \cdot & 1.0 \end{matrix} \quad (4.3-3)$$

The dimensions of the I matrix include only Quadrant I.

The $I - A$ matrix is shown in Table 4.3-4. This matrix is derived by subtracting the direct requirements matrix from the identity matrix.

In matrix algebra notation, the $I - A$ matrix is presented below.

$$I - A = \begin{matrix} (1.0 - a_{11}) & -a_{12} & \cdot & -a_{1n} \\ -a_{21} & (1.0 - a_{22}) & \cdot & -a_{2n} \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ -a_{n1} & -a_{n2} & \cdot & (1.0 - a_{nn}) \end{matrix} \quad (4.3-4)$$

The dimensions of the $I - A$ matrix include only Quadrant I.

Final demand requirements are shown in Table 4.3-5. These requirements are derived by taking the inverse of the $I - A$ matrix.

Final demand requirements show the dollar amount of change in economic activity of the row sector from a one dollar change in final demand of the column sector. The column totals are the final demand total requirements that show the total dollar amount of change in economic activity of all row sectors combined from a one dollar change in final demand of the column sector.

In matrix algebra notation, the final demand requirements are denoted by b_{ij} 's. Where b is the dollar amount of change in economic activity of row sector i from a one dollar change in final demand of column sector j . The C_j 's are the final demand total requirements for column sector j .

The final demand requirements are represented by the B matrix presented below.

$$\begin{array}{rcccc}
 B = & b_{11} & b_{12} & \cdot & b_{1n} \\
 + & b_{21} & b_{22} & \cdot & b_{2n} \\
 & \cdot & \cdot & \cdot & \cdot \\
 & \cdot & \cdot & \cdot & \cdot \\
 + & b_{n1} & b_{n2} & \cdot & b_{nn} \\
 = & B_1 & B_2 & \cdot & B_n
 \end{array} \tag{4.3-5}$$

The dimensions of the B matrix include only Quadrant I.

The final demand total requirements are the same as the final demand multipliers.

Table 4.3-3. Identity Matrix.

Economic Sector	1	2	3	4	5	6	7	8	9
	Livestock Production	Dairy Production	Alfalfa Hay Production	Other Hay Production	Barley Production	Agricultural Services	Gold Mining	Other Mining	Construction
1 Livestock Production	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
2 Dairy Production	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
3 Alfalfa Hay Production	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
4 Other Hay Production	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
5 Barley Production	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000
6 Agricultural Services	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000
7 Gold Mining	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000
8 Other Mining	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000
9 Construction	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000
10 Manufacturing	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
11 Transportation and Communications	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
12 Utilities	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
13 Trade	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
14 Eating, Drinking, and Lodging	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
15 Finance, Insurance, and Real Estate	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
16 Services	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
17 Hotels, Gaming, and Recreation	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
18 Health	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
19 Local Government	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
20 Households	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Column Total	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

Table 4.3-3. Identity Matrix (continue).

	10 Manufacturing	11 Transportation and Communications	12 Utilities	13 Trade	14 Eating, Drinking, and Lodging	15 Finance, Insurance, and Real Estate	16 Services	17 Hotels, Gaming, and Recreation	18 Health	19 Local Government	20 Households
1	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
2	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
3	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
4	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
5	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
6	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
7	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
8	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
9	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
10	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
11	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
12	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
13	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
14	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
15	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000
17	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000
18	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000
19	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000
20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000
	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

Table 4.3-4. I - A Matrix.

Economic Sector	1 Livestock Production	2 Dairy Production	3 Alfalfa Hay Production	4 Other Hay Production	5 Barley Production	6 Agricultural Services	7 Gold Mining	8 Other Mining	9 Construction
1 Livestock Production	0.78885207	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
2 Dairy Production	-0.00022399	0.99901250	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
3 Alfalfa Hay Production	0.00000000	-0.07083333	1.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
4 Other Hay Production	-0.08833268	0.00000000	0.00000000	1.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
5 Barley Production	-0.00060848	0.00000000	0.00000000	0.00000000	1.00000000	0.00000000	0.00000000	0.00000000	0.00000000
6 Agricultural Services	-0.01487967	-0.00312500	-0.07500000	-0.00892857	0.00000000	0.99829184	-0.00020671	0.00000000	-0.00120014
7 Gold Mining	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	-0.00180306	1.00000000	-0.00085456	0.00000000
8 Other Mining	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	-0.00005694	-0.00005638	0.99875700	-0.00000625
9 Construction	-0.00811031	-0.00870104	0.00000000	0.00000000	0.00000000	-0.00903642	-0.00472643	-0.04340515	0.85403702
10 Manufacturing	-0.02763355	-0.05312500	0.00000000	-0.02321429	-0.02777778	-0.03917400	-0.03420153	-0.00722500	-0.05028591
11 Transportation and Communications	-0.00897482	-0.01770833	0.00000000	-0.00714286	0.00000000	-0.01218494	-0.01296651	-0.00598200	-0.00984894
12 Utilities	-0.00495979	-0.00833333	-0.02187500	-0.01250000	0.00000000	-0.00920513	-0.05626339	-0.05997516	-0.00476031
13 Trade	-0.03542764	-0.01979167	-0.05625000	-0.05178571	-0.08333333	-0.01370332	-0.00189800	-0.01530456	-0.04997355
14 Eating, Drinking, and Lodging	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	-0.00400270	0.00000000	0.00000000
15 Finance, Insurance, and Real Estate	-0.03849790	-0.03854167	-0.06250000	-0.06250000	-0.05555556	-0.02139007	-0.05487277	-0.02043192	-0.02299568
16 Services	-0.00850259	-0.00833333	-0.08437500	-0.01250000	0.00000000	-0.02736866	-0.05265532	-0.02594780	-0.03248854
17 Hotels, Gaming, and Recreation	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
18 Health	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	-0.00038844	0.00000000
19 Local Government	-0.02149273	-0.01041667	-0.03750000	-0.05892857	0.00000000	-0.02237702	-0.01681888	-0.01996580	-0.00820456
20 Households	-0.16178568	-0.22500000	-0.40625000	-0.37857143	-0.30555556	-0.42301852	-0.31215470	-0.26017710	-0.28854721
Column Total	0.36942226	0.53510313	0.25625000	0.38392857	0.52777778	0.41897378	0.44917667	0.53909952	0.38572592

Table 4.3-4. I - A Matrix (continue).

	10 Manufacturing	11 Transportation and Communications	12 Utilities	13 Trade	14 Eating, Drinking, and Lodging	15 Finance, Insurance, and Real Estate	16 Services	17 Hotels, Gaming, and Recreation	18 Health	19 Local Government	20 Households
1	-0.00094908	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	-0.00001988	0.00000000	0.00000000	0.00000000	-0.00006351
2	-0.00064605	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	-0.00000393	0.00000000	0.00000000	0.00000000	-0.00000095
3	-0.00000733	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	-0.00002250
4	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	-0.00002767
5	-0.00000520	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	-0.00001067	0.00000000	0.00000000	0.00000000	0.00000000
6	-0.00005868	-0.00001894	-0.00004881	-0.00005928	0.00000000	-0.00441466	-0.00006047	0.00000000	0.00000000	0.00000000	-0.00003717
7	-0.00167006	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
8	-0.00213286	0.00000000	-0.00004416	0.00000000	0.00000000	0.00000000	-0.00000083	0.00000000	-0.00002553	0.00000000	-0.00000083
9	-0.00876680	-0.02008251	-0.03743939	-0.00631028	-0.00531120	-0.04509217	-0.01768421	-0.00097584	-0.00968944	-0.06875938	-0.00322382
10	0.92377009	-0.01289977	-0.01005948	-0.01571718	-0.01842733	-0.00589973	-0.01198664	-0.01808085	-0.02047789	-0.00577701	-0.01612916
11	-0.02146061	0.95862631	-0.01437101	-0.01903902	-0.00752358	-0.00899144	-0.01817795	-0.00704658	-0.01247956	-0.00695658	-0.02051437
12	-0.02408781	-0.00492399	0.89527962	-0.02267888	-0.04022075	-0.01095198	-0.01862196	-0.01784883	-0.01458051	-0.01839250	-0.01861080
13	-0.01390026	-0.00421109	-0.00062988	0.99796143	-0.05431823	-0.00184620	-0.00664774	-0.00827938	-0.01708843	-0.02075860	-0.08228568
14	0.00000000	-0.01068939	-0.00122257	-0.00768075	1.00000000	-0.00731893	-0.01630167	0.00000000	0.00000000	0.00000000	-0.02879556
15	-0.01321009	-0.01808890	-0.00753764	-0.05377290	-0.03127616	0.89181833	-0.03555899	-0.00432913	-0.05539812	-0.02240917	-0.07380279
16	-0.02648031	-0.04886789	-0.00780028	-0.05241780	-0.02185673	-0.02947113	0.93175069	-0.01693029	-0.04948723	-0.02981730	-0.09741388
17	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.95655235	0.00000000	0.00000000	-0.02966750
18	-0.00008435	0.00000000	0.00000000	0.00000000	0.00000000	-0.00072154	-0.00171971	-0.03111375	0.95254164	-0.00209517	-0.06060866
19	-0.00639784	-0.00461556	-0.00619885	-0.00570773	-0.00631362	-0.00878518	-0.00524861	-0.03690843	-0.00634790	0.82476138	-0.02451837
20	-0.26369049	-0.40103999	-0.12544132	-0.48690061	-0.33365810	-0.13871607	-0.39651269	-0.32280030	-0.42231663	-0.37108700	0.99903471
	0.54022228	0.43318829	0.68448623	0.32767700	0.48109430	0.62960929	0.40319473	0.49223898	0.34465039	0.27870867	0.54331149

Table 4.3-5. Final Demand Requirements.

Economic Sector	1 Livestock Production	2 Dairy Production	3 Alfalfa Hay Production	4 Other Hay Production	5 Barley Production	6 Agricultural Services	7 Gold Mining	8 Other Mining	9 Construction
1 Livestock Production	1.26776906	0.00011998	0.00009036	0.00010315	0.00009249	0.00012434	0.00010602	0.00006396	0.00014208
2 Dairy Production	0.00032138	1.00103514	0.00001780	0.00002951	0.00002949	0.00004023	0.00003529	0.00001614	0.00005289
3 Alfalfa Hay Production	0.00003285	0.07091630	1.00001687	0.00001573	0.00001285	0.00001690	0.00001381	0.00001059	0.00001626
4 Other Hay Production	0.11199732	0.00002182	0.00002695	1.00002548	0.00002100	0.00002771	0.00002280	0.00001706	0.00002721
5 Barley Production	0.00077252	0.00000122	0.00000216	0.00000131	1.00000098	0.00000155	0.00000164	0.00000107	0.00000172
6 Agricultural Services	0.02047070	0.00893928	0.07587868	0.00962162	0.00056174	1.00218488	0.00078952	0.00042291	0.00187418
7 Gold Mining	0.00013109	0.00013495	0.00017921	0.00009115	0.00007540	0.00190840	1.00009021	0.00089620	0.00013758
8 Other Mining	0.00012401	0.00015477	0.00006286	0.00009821	0.00009719	0.00018994	0.00017495	1.00130067	0.00018162
9 Construction	0.02977421	0.02452043	0.02594517	0.02336358	0.01371873	0.02788598	0.02502261	0.06642639	1.18685061
10 Manufacturing	0.05632947	0.07107573	0.02535509	0.04413877	0.04449433	0.06061927	0.05307174	0.02380980	0.08026513
11 Transportation and Communications	0.02949527	0.03383069	0.02607464	0.02876511	0.01691848	0.03331389	0.03195035	0.02178586	0.03188783
12 Utilities	0.02751813	0.02805091	0.05301548	0.03811050	0.01885050	0.03307428	0.08248061	0.08305181	0.02831763
13 Trade	0.09238912	0.06245557	0.12109337	0.10754835	0.12568942	0.06991315	0.04783730	0.05606476	0.10778321
14 Eating, Drinking, and Lodging	0.01549750	0.01442114	0.02513621	0.02078355	0.01642180	0.02077968	0.02163507	0.01453288	0.01898053
15 Finance, Insurance, and Real Estate	0.11355460	0.09429669	0.15098844	0.13735208	0.11534741	0.08984502	0.11608365	0.07038053	0.09132535
16 Services	0.07579342	0.07241941	0.18521607	0.09575682	0.06483640	0.10876997	0.12216153	0.08458647	0.11360231
17 Hotels, Gaming, and Recreation	0.01332535	0.01257408	0.02125876	0.01834994	0.01438011	0.01874956	0.01505879	0.01278517	0.01643224
18 Health	0.02812975	0.02648609	0.04492130	0.03873344	0.03021906	0.03945725	0.03178617	0.02735277	0.03460036
19 Local Government	0.05874603	0.03214322	0.07402698	0.09442580	0.01803818	0.04982969	0.03974764	0.04068884	0.03222442
20 Households	0.42964153	0.40541884	0.68543415	0.59164650	0.46364964	0.60453132	0.48553208	0.41222501	0.52981530
Column Total	2.37181331	1.95901623	2.51474055	2.24896056	1.94345518	2.16126301	2.07360180	1.91641888	2.27451846

Table 4.3-5. Final Demand Requirements (continue).

	10 Manufacturing	11 Transportation and Communications	12 Utilities	13 Trade	14 Eating, Drinking, and Lodging	15 Finance, Insurance, and Real Estate	16 Services	17 Hotels, Gaming, and Recreation	18 Health	19 Local Government	20 Households
1	0.00135448	0.00008977	0.00004485	0.00010435	0.00008605	0.00004618	0.00011531	0.00008573	0.00010689	0.00009562	0.00014271
2	0.00070984	0.00002226	0.00001426	0.00002568	0.00002416	0.00001284	0.00002599	0.00002408	0.00002905	0.00002208	0.00002264
3	0.00006772	0.00001498	0.00000620	0.00001753	0.00001326	0.00000705	0.00001534	0.00001324	0.00001677	0.00001675	0.00002983
4	0.00013121	0.00002412	0.00001015	0.00002820	0.00002148	0.00001146	0.00002650	0.00002143	0.00002714	0.00002682	0.00004702
5	0.00000744	0.00000161	0.00000057	0.00000181	0.00000122	0.00000090	0.00001252	0.00000116	0.00000178	0.00000159	0.00000187
6	0.00042490	0.00048114	0.00029200	0.00073305	0.00047148	0.00520147	0.00061705	0.00032764	0.00068103	0.00064793	0.00065414
7	0.00183324	0.00005562	0.00003644	0.00006450	0.00006111	0.00004116	0.00005511	0.00006069	0.00007331	0.00005528	0.00005504
8	0.00234401	0.00007299	0.00009655	0.00008499	0.00008131	0.00004316	0.00007365	0.00008086	0.00012265	0.00007389	0.00007395
9	0.02369612	0.03921347	0.05549533	0.02756234	0.02209497	0.06761178	0.03833619	0.01740048	0.03129967	0.11499535	0.02293341
10	1.09605525	0.03274770	0.02145720	0.03778609	0.03603903	0.01900862	0.03229417	0.03594780	0.04309735	0.03236270	0.03221500
11	0.03849158	1.06274000	0.02473331	0.04297963	0.02605997	0.02066669	0.03961539	0.02489735	0.03583285	0.03198350	0.03639103
12	0.04459140	0.02730820	1.12566614	0.05058695	0.06436884	0.02470590	0.04367436	0.03992397	0.04122566	0.04933945	0.03935035
13	0.05378710	0.05929041	0.02385108	1.06532307	0.10055794	0.03026378	0.06253118	0.05571883	0.07706956	0.09016465	0.11041228
14	0.01477710	0.03142825	0.00918757	0.03180898	1.01773795	0.01778995	0.03746411	0.01701394	0.02272090	0.02307019	0.04049098
15	0.06242695	0.08472350	0.03505524	0.13422857	0.09190233	1.15325984	0.10574057	0.06161422	0.13524821	0.10490860	0.12553404
16	0.08607168	0.12945673	0.04079044	0.14521155	0.09148918	0.07268208	1.15074434	0.08603932	0.13998768	0.12784994	0.15154910
17	0.01295794	0.01814742	0.00693866	0.02127806	0.01555733	0.00827276	0.01828207	1.06094957	0.01984333	0.02059720	0.03857693
18	0.02736118	0.03818453	0.01460167	0.04478720	0.03272206	0.01829872	0.04032781	0.06686129	1.09161089	0.04596528	0.08086964
19	0.02435965	0.02769514	0.01727267	0.03287892	0.02705731	0.02279980	0.02902819	0.06550437	0.03253316	1.23819220	0.04370713
20	0.41779557	0.58511678	0.22371941	0.68605625	0.50160610	0.26673387	0.58945824	0.50067614	0.63979726	0.66410381	1.24381409
	1.90924436	2.13681463	1.59926976	2.32154772	2.02795308	1.72745799	2.18843808	2.03316211	2.31132517	2.54447284	1.96687119

Output Requirements

Output requirements measure the change in total economic activity from a change in output.

Output requirements are shown in Table 4.3-6. These requirements are derived by taking the final demand requirements in the B matrix and dividing them by their respective intersectoral final demand requirements. The intersectoral final demand requirements are the final demand requirements along the main diagonal in the B matrix. In so doing, the output requirements along the main diagonal become one's.

Output requirements show the dollar amount of change in economic activity of the row sector from a one dollar change in output of the column sector. The column totals are the output total requirements that show the total dollar amount of change in economic activity of all row sectors from a one dollar change in output of the column sector.

In matrix algebra notation, the output requirements are denoted by c_{ij} 's. Where c is the dollar amount of change in economic activity of row sector i from a one dollar change in output of column sector j . The C_j 's are the output total requirements for column sector j .

The output requirements are represented by the C matrix presented below.

$$\begin{array}{rcccc}
 C = & c_{11} & c_{12} & \cdot & c_{1n} \\
 + & c_{21} & c_{22} & \cdot & c_{2n} \\
 & \cdot & \cdot & \cdot & \cdot \\
 & \cdot & \cdot & \cdot & \cdot \\
 + & c_{n1} & c_{n2} & \cdot & c_{nn} \\
 = & C_1 & C_2 & \cdot & C_n
 \end{array} \tag{4.3-6}$$

The dimensions of the B matrix include only Quadrant I.

The output total requirements are the same as the output multipliers.

Table 4.3-6. Output Requirements.

Economic Sector	1 Livestock Production	2 Dairy Production	3 Alfalfa Hay Production	4 Other Hay Production	5 Barley Production	6 Agricultural Services	7 Gold Mining	8 Other Mining	9 Construction
1 Livestock Production	1.0000000	0.00011985	0.00009035	0.00010315	0.00009249	0.00012407	0.00010601	0.00006388	0.00011972
2 Dairy Production	0.00025350	1.00000000	0.00001780	0.00002950	0.00002949	0.00004014	0.00003528	0.00001611	0.00004456
3 Alfalfa Hay Production	0.00002591	0.07084297	1.00000000	0.00001573	0.00001285	0.00001686	0.00001381	0.00001058	0.00001370
4 Other Hay Production	0.08834205	0.00002179	0.00002695	1.00000000	0.00002100	0.00002765	0.00002280	0.00001703	0.00002293
5 Barley Production	0.00060935	0.00000121	0.00000216	0.00000131	1.00000000	0.00000155	0.00000164	0.00000106	0.00000145
6 Agricultural Services	0.01614703	0.00893004	0.07587740	0.00962137	0.00056174	1.00000000	0.00078945	0.00042236	0.00157912
7 Gold Mining	0.00010340	0.00013481	0.00017921	0.00009114	0.00007540	0.00190424	1.00000000	0.00089503	0.00011592
8 Other Mining	0.00009782	0.00015461	0.00006286	0.00009820	0.00009719	0.00018952	0.00017494	1.00000000	0.00015303
9 Construction	0.02348552	0.02449507	0.02594473	0.02336298	0.01371871	0.02782518	0.02502035	0.06634010	1.00000000
10 Manufacturing	0.04443197	0.07100223	0.02535466	0.04413765	0.04449428	0.06048712	0.05306695	0.02377887	0.06762867
11 Transportation and Communications	0.02326549	0.03379571	0.02607420	0.02876437	0.01691846	0.03324126	0.03194747	0.02175756	0.02686760
12 Utilities	0.02170595	0.02802190	0.05301459	0.03810953	0.01885048	0.03300218	0.08247317	0.08294393	0.02385947
13 Trade	0.07287535	0.06239098	0.12109133	0.10754560	0.12568929	0.06976074	0.04783299	0.05599193	0.09081447
14 Eating, Drinking, and Lodging	0.01222423	0.01440623	0.02513578	0.02078302	0.01642178	0.02073438	0.02163312	0.01451400	0.01599235
15 Finance, Insurance, and Real Estate	0.08957041	0.09419918	0.15098590	0.13734858	0.11534730	0.08964914	0.11607318	0.07028911	0.07694764
16 Services	0.05978488	0.07234453	0.18521294	0.09575438	0.06483634	0.10853284	0.12215052	0.08447660	0.09571745
17 Hotels, Gaming, and Recreation	0.01051086	0.01256108	0.02125840	0.01834947	0.01438009	0.01870868	0.01505743	0.01276856	0.01384525
18 Health	0.02218839	0.02645870	0.04492055	0.03873246	0.03021903	0.03937123	0.03178330	0.02731724	0.02915308
19 Local Government	0.04633812	0.03210998	0.07402573	0.09442339	0.01803816	0.04972106	0.03974405	0.04063598	0.02715120
20 Households	0.33889574	0.40499961	0.68542258	0.59163142	0.46364919	0.60321338	0.48548829	0.41168954	0.44640437
Column Total	1.87085597	1.95699048	2.51469813	2.24890326	1.94345328	2.15655122	2.07341476	1.91392950	1.91643197

Table 4.3-6. Output Requirements (continue).

	10 Manufacturing	11 Transportation and Communications	12 Utilities	13 Trade	14 Eating, Drinking, and Lodging	15 Finance, Insurance, and Real Estate	16 Services	17 Hotels, Gaming, and Recreation	18 Health	19 Local Government	20 Households
1	0.00123578	0.00008447	0.00003985	0.00009795	0.00008455	0.00004004	0.00010021	0.00008080	0.00009792	0.00007723	0.00011474
2	0.00064763	0.00002095	0.00001267	0.00002411	0.00002374	0.00001114	0.00002259	0.00002270	0.00002661	0.00001783	0.00001820
3	0.00006179	0.00001410	0.00000551	0.00001646	0.00001303	0.00000611	0.00001333	0.00001248	0.00001536	0.00001352	0.00002398
4	0.00011971	0.00002270	0.00000902	0.00002647	0.00002111	0.00000994	0.00002303	0.00002020	0.00002487	0.00002166	0.00003781
5	0.00000679	0.00000151	0.00000051	0.00000170	0.00000119	0.00000078	0.00001088	0.00000109	0.00000163	0.00000128	0.00000150
6	0.00038766	0.00045273	0.00025940	0.00068811	0.00046327	0.00451023	0.00053622	0.00030882	0.00062388	0.00052328	0.00052591
7	0.00167258	0.00005234	0.00003238	0.00006054	0.00006004	0.00003569	0.00004789	0.00005721	0.00006716	0.00004464	0.00004425
8	0.00213859	0.00006868	0.00008578	0.00007977	0.00007989	0.00003742	0.00006400	0.00007622	0.00011236	0.00005967	0.00005945
9	0.02161946	0.03689846	0.04929999	0.02587228	0.02170989	0.05862667	0.03331426	0.01640085	0.02867292	0.09287359	0.01843797
10	1.00000000	0.03081441	0.01906178	0.03546914	0.03541092	0.01648251	0.02806372	0.03388267	0.03948051	0.02613705	0.02590017
11	0.03511828	1.00000000	0.02197215	0.04034422	0.02560578	0.01792024	0.03442588	0.02346705	0.03282566	0.02583081	0.02925761
12	0.04068353	0.02569603	1.00000000	0.04748507	0.06324697	0.02142266	0.03795314	0.03763042	0.03776590	0.03984797	0.03163684
13	0.04907335	0.05579014	0.02118841	1.00000000	0.09880534	0.02624194	0.05433976	0.05251789	0.07060168	0.07281959	0.08876912
14	0.01348207	0.02957285	0.00816190	0.02985853	1.00000000	0.01542580	0.03255641	0.01603652	0.02081411	0.01863215	0.03255388
15	0.05695602	0.07972176	0.03114177	0.12599800	0.09030058	1.00000000	0.09188884	0.05807460	0.12389782	0.08472724	0.10092669
16	0.07852859	0.12181412	0.03623671	0.13630752	0.08989463	0.06302316	1.00000000	0.08109652	0.12823954	0.10325533	0.12184224
17	0.01182234	0.01707606	0.00616405	0.01997334	0.01528618	0.00717337	0.01588717	1.00000000	0.01817803	0.01663490	0.03101503
18	0.02496332	0.03593027	0.01297158	0.04204096	0.03215176	0.01586695	0.03504498	0.06302023	1.00000000	0.03712290	0.06501747
19	0.02222484	0.02606013	0.01534440	0.03086287	0.02658573	0.01978987	0.02522557	0.06174126	0.02980289	1.00000000	0.03513960
20	0.38118112	0.55057378	0.19874402	0.64398891	0.49286371	0.23128688	0.51224083	0.47191323	0.58610377	0.53634954	1.00000000
	1.74192345	2.01066547	1.42073187	2.17919595	1.99260830	1.49789140	1.90175871	1.91636074	2.11735261	2.05499020	1.58132249

Employment Requirements

Employment requirements measure the change in employment from a change in output. Employment is the number of jobs.

Employment requirements are the output response coefficients for employment. These requirements show the number of jobs required to produce one dollar of output in a given sector.

The employment requirements are shown in Table 4.3-7. These are taken from Table 4.2-71 as the output response coefficients for employment. They are placed along the main diagonal of the matrix. Zero's are placed in other locations of the matrix.

In matrix algebra notation, the employment requirements are denoted by d_{ij} 's. Where d is the number of jobs required to produce one dollar of output in row sector i and column sector j , being that $i = j$. Column totals are denoted by D_j 's.

The employment requirements matrix is represented by the D matrix presented below.

$$\begin{array}{rcccc}
 D = & & d_{11} & 0.0 & \cdot & 0.0 \\
 + & & 0.0 & d_{22} & \cdot & 0.0 \\
 & & \cdot & \cdot & \cdot & \cdot \\
 & & \cdot & \cdot & \cdot & \cdot \\
 + & & 0.0 & 0.0 & \cdot & d_{nn} \\
 = & & D_1 & D_2 & \cdot & D_n
 \end{array} \tag{4.3-7}$$

The dimensions of the D matrix include only Quadrant I.

The employment requirements are not the same as employment multipliers. Employment multipliers instead measure the total change in the number of jobs from a single job change in a given sector.

A total employment requirements matrix is necessary to calculate the employment multipliers.

Total employment requirements are shown in Table 4.3-8. These requirements are derived by multiplying the employment requirements matrix by the final demand requirements matrix.

Total employment requirements show the total number of jobs in row sector i and column sector j created by employment.

In matrix algebra notation, the total employment requirements are denoted by e_{ij} 's. Where e is the total number of jobs in row sector i and column sector j . Column totals are denoted by E_j 's.

The total employment requirements are represented by the E matrix presented below.

$$\begin{array}{rcccccc}
 E = & & e_{11} & e_{12} & \cdot & & e_{1n} & \\
 & + & e_{21} & e_{22} & \cdot & & e_{2n} & \\
 & & \cdot & \cdot & \cdot & & \cdot & \\
 & & \cdot & \cdot & \cdot & & \cdot & \\
 & & \cdot & \cdot & \cdot & & \cdot & \\
 & + & e_{n1} & e_{n2} & \cdot & & e_{nn} & \\
 & = & E_1 & E_2 & \cdot & & E_n &
 \end{array} \tag{4.3-8}$$

The dimensions of the E matrix include only Quadrant I.

Employment multipliers are calculated by dividing the column totals of the total employment requirements matrix by the column totals of the employment requirements matrix.

Employment multipliers show the total change in the number of jobs of all row sectors from a single job change in the column sector.

Table 4.3-7. Employment Requirements.

Economic Sector	1 Livestock Production	2 Dairy Production	3 Alfalfa Hay Production	4 Other Hay Production	5 Barley Production	6 Agricultural Services	7 Gold Mining	8 Other Mining	9 Construction
1 Livestock Production	0.00001887	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
2 Dairy Production	0.00000000	0.00002188	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
3 Alfalfa Hay Production	0.00000000	0.00000000	0.00001875	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
4 Other Hay Production	0.00000000	0.00000000	0.00000000	0.00001786	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
5 Barley Production	0.00000000	0.00000000	0.00000000	0.00000000	0.00002778	0.00000000	0.00000000	0.00000000	0.00000000
6 Agricultural Services	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00002557	0.00000000	0.00000000	0.00000000
7 Gold Mining	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00002873	0.00000000	0.00000000
8 Other Mining	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00001604	0.00000000
9 Construction	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000871
10 Manufacturing	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
11 Transportation and Communications	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
12 Utilities	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
13 Trade	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
14 Eating, Drinking, and Lodging	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
15 Finance, Insurance, and Real Estate	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
16 Services	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
17 Hotels, Gaming, and Recreation	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
18 Health	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
19 Local Government	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
20 Households	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
Column Total	0.00001887	0.00002188	0.00001875	0.00001786	0.00002778	0.00002557	0.00002873	0.00001604	0.00000871

Table 4.3-7. Employment Requirements (continue).

	10 Manufacturing	11 Transportation and Communications	12 Utilities	13 Trade	14 Eating, Drinking, and Lodging	15 Finance, Insurance, and Real Estate	16 Services	17 Hotels, Gaming, and Recreation	18 Health	19 Local Government	20 Households
1	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
2	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
3	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
4	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
5	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
6	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
7	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
8	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
9	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
10	0.0000825	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
11	0.0000000	0.0001181	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
12	0.0000000	0.0000000	0.0000626	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
13	0.0000000	0.0000000	0.0000000	0.0002523	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
14	0.0000000	0.0000000	0.0000000	0.0000000	0.0001885	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
15	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0001130	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0002893	0.0000000	0.0000000	0.0000000	0.0000000
17	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0001883	0.0000000	0.0000000	0.0000000
18	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0002934	0.0000000	0.0000000	0.0000000
19	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0001769	0.0000000	0.0000000
20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
	0.0000825	0.0001181	0.0000626	0.0002523	0.0001885	0.0001130	0.0002893	0.0001883	0.0002934	0.0001769	0.0000000

Table 4.3-8. Total Employment Requirements.

Economic Sector	1 Livestock Production	2 Dairy Production	3 Alfalfa Hay Production	4 Other Hay Production	5 Barley Production	6 Agricultural Services	7 Gold Mining	8 Other Mining	9 Construction
1 Livestock Production	0.00002392	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
2 Dairy Production	0.00000001	0.00002190	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
3 Alfalfa Hay Production	0.00000000	0.00000133	0.00001875	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
4 Other Hay Production	0.00000200	0.00000000	0.00000000	0.00001786	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
5 Barley Production	0.00000002	0.00000000	0.00000000	0.00000000	0.00002778	0.00000000	0.00000000	0.00000000	0.00000000
6 Agricultural Services	0.00000052	0.00000023	0.00000194	0.00000025	0.00000001	0.00002563	0.00000002	0.00000001	0.00000005
7 Gold Mining	0.00000000	0.00000000	0.00000001	0.00000000	0.00000000	0.00000005	0.00002873	0.00000003	0.00000000
8 Other Mining	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00001606	0.00000000
9 Construction	0.00000026	0.00000021	0.00000023	0.00000020	0.00000012	0.00000024	0.00000022	0.00000058	0.00001034
10 Manufacturing	0.00000046	0.00000059	0.00000021	0.00000036	0.00000037	0.00000050	0.00000044	0.00000020	0.00000066
11 Transportation and Communications	0.00000035	0.00000040	0.00000031	0.00000034	0.00000020	0.00000039	0.00000038	0.00000026	0.00000038
12 Utilities	0.00000017	0.00000018	0.00000033	0.00000024	0.00000012	0.00000021	0.00000052	0.00000052	0.00000018
13 Trade	0.00000233	0.00000158	0.00000306	0.00000271	0.00000317	0.00000176	0.00000121	0.00000141	0.00000272
14 Eating, Drinking, and Lodging	0.00000029	0.00000027	0.00000047	0.00000039	0.00000031	0.00000039	0.00000041	0.00000027	0.00000036
15 Finance, Insurance, and Real Estate	0.00000128	0.00000107	0.00000171	0.00000155	0.00000130	0.00000102	0.00000131	0.00000080	0.00000103
16 Services	0.00000219	0.00000210	0.00000536	0.00000277	0.00000188	0.00000315	0.00000353	0.00000245	0.00000329
17 Hotels, Gaming, and Recreation	0.00000025	0.00000024	0.00000040	0.00000035	0.00000027	0.00000035	0.00000028	0.00000024	0.00000031
18 Health	0.00000083	0.00000078	0.00000132	0.00000114	0.00000089	0.00000116	0.00000093	0.00000080	0.00000102
19 Local Government	0.00000104	0.00000057	0.00000131	0.00000167	0.00000032	0.00000088	0.00000070	0.00000072	0.00000057
20 Households	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
Column Total	0.00003593	0.00003143	0.00003540	0.00002984	0.00003674	0.00003575	0.00003868	0.00002434	0.00002091

Table 4.3-8. Total Employment Requirements (continue).

	10 Manufacturing	11 Transportation and Communications	12 Utilities	13 Trade	14 Eating, Drinking, and Lodging	15 Finance, Insurance, and Real Estate	16 Services	17 Hotels, Gaming, and Recreation	18 Health	19 Local Government	20 Households
1	0.0000003	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
2	0.0000002	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
3	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
4	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
5	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
6	0.0000001	0.0000001	0.0000001	0.0000002	0.0000001	0.0000013	0.0000002	0.0000001	0.0000002	0.0000002	0.0000002
7	0.0000005	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
8	0.0000004	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
9	0.0000021	0.0000034	0.0000048	0.0000024	0.0000019	0.0000059	0.0000033	0.0000015	0.0000027	0.0000100	0.0000020
10	0.0000904	0.0000027	0.0000018	0.0000031	0.0000030	0.0000016	0.0000027	0.0000030	0.0000036	0.0000027	0.0000027
11	0.0000045	0.0001255	0.0000029	0.0000051	0.0000031	0.0000024	0.0000047	0.0000029	0.0000042	0.0000038	0.0000043
12	0.0000028	0.0000017	0.00000705	0.0000032	0.0000040	0.0000015	0.0000027	0.0000025	0.0000026	0.0000031	0.0000025
13	0.0000136	0.0000150	0.0000060	0.00002688	0.00000254	0.0000076	0.0000158	0.0000141	0.0000194	0.0000227	0.0000279
14	0.0000028	0.0000059	0.0000017	0.0000060	0.0001918	0.0000034	0.0000071	0.0000032	0.0000043	0.0000043	0.0000076
15	0.0000071	0.0000096	0.0000040	0.0000152	0.0000104	0.00001303	0.0000119	0.0000070	0.0000153	0.0000119	0.0000142
16	0.0000249	0.0000375	0.0000118	0.0000420	0.0000265	0.0000210	0.0000329	0.0000249	0.0000405	0.0000370	0.0000438
17	0.0000024	0.0000034	0.0000013	0.0000040	0.0000029	0.0000016	0.0000034	0.0001998	0.0000037	0.0000039	0.0000073
18	0.0000080	0.0000112	0.0000043	0.0000131	0.0000096	0.0000054	0.0000118	0.0000196	0.0003203	0.0000135	0.0000237
19	0.0000043	0.0000049	0.0000031	0.0000058	0.0000048	0.0000040	0.0000051	0.0000116	0.0000058	0.00002190	0.0000077
20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
	0.00001644	0.00002209	0.00001123	0.00003689	0.00002836	0.00001861	0.00004018	0.00002901	0.00004227	0.00003321	0.00001439

Income Requirements

Income requirements measure the change in income from a change in output.

Income requirements are the output response coefficients for income. These requirements show the income required to produce one dollar of output in a given sector.

The income requirements are shown in Table 4.3-9. These are taken from Table 4.2-71 as the output response coefficients for employment. They are placed along the main diagonal of the matrix. Zero's are placed in other locations of the matrix.

In matrix algebra notation, the income requirements are denoted by f_{ij} 's. Where f is the income required to produce one dollar of output in row sector i and column sector j , being that $i = j$. Column totals are denoted by F_j 's.

The income requirements matrix is represented by the F matrix presented below.

$$\begin{array}{rcccccl} F = & & f_{11} & 0.0 & \cdot & 0.0 & \\ & + & 0.0 & f_{22} & \cdot & 0.0 & \\ & & \cdot & \cdot & \cdot & \cdot & \\ & & \cdot & \cdot & \cdot & \cdot & \\ & + & 0.0 & 0.0 & \cdot & f_{nn} & \\ = & & F_1 & F_2 & \cdot & F_n & \end{array} \quad (4.3-9)$$

The dimensions of the F matrix include only Quadrant I.

The income requirements are not the same as income multipliers. Income multipliers instead measure the total dollar amount of change in income from a one dollar change in income in a given sector.

A total income requirements matrix is necessary to calculate the income multipliers.

Total income requirements are shown in Table 4.3-10. These requirements are derived by multiplying the income requirements matrix by the final demand requirements matrix.

Total income requirements show the total dollar amount of income in row sector i and column sector j created by income.

In matrix algebra notation, the total income requirements are denoted by g_{ij} 's. Where g is the total dollar amount of income in row sector i and column sector j . Column totals are denoted by G_j 's.

The total income requirements are represented by the G matrix presented below.

$$\begin{array}{rcccc}
 G = & g_{11} & g_{12} & \cdot & g_{1n} \\
 + & g_{21} & g_{22} & \cdot & g_{2n} \\
 & \cdot & \cdot & \cdot & \cdot \\
 & \cdot & \cdot & \cdot & \cdot \\
 & \cdot & \cdot & \cdot & \cdot \\
 + & g_{n1} & g_{n2} & \cdot & g_{nn} \\
 = & G_1 & G_2 & \cdot & G_n
 \end{array} \tag{4.3-10}$$

The dimensions of the G matrix include only Quadrant I.

Income multipliers are calculated by dividing the column totals of the total income requirements matrix by the column totals of the income requirements matrix.

Income multipliers show the total dollar amount of change in income of all row sectors from a one dollar change in income of a column sector.

Table 4.3-9. Income Requirements.

Economic Sector	1 Livestock Production	2 Dairy Production	3 Alfalfa Hay Production	4 Other Hay Production	5 Barley Production	6 Agricultural Services	7 Gold Mining	8 Other Mining	9 Construction
1 Livestock Production	0.16178555	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
2 Dairy Production	0.00000000	0.22500000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
3 Alfalfa Hay Production	0.00000000	0.00000000	0.40625000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
4 Other Hay Production	0.00000000	0.00000000	0.00000000	0.37857143	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
5 Barley Production	0.00000000	0.00000000	0.00000000	0.00000000	0.30555556	0.00000000	0.00000000	0.00000000	0.00000000
6 Agricultural Services	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.42301852	0.00000000	0.00000000	0.00000000
7 Gold Mining	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.31215470	0.00000000	0.00000000
8 Other Mining	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.26017713	0.00000000
9 Construction	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.28854721
10 Manufacturing	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
11 Transportation and Communications	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
12 Utilities	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
13 Trade	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
14 Eating, Drinking, and Lodging	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
15 Finance, Insurance, and Real Estate	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
16 Services	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
17 Hotels, Gaming, and Recreation	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
18 Health	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
19 Local Government	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
20 Households	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
Column Total	0.16178555	0.22500000	0.40625000	0.37857143	0.30555556	0.42301852	0.31215470	0.26017713	0.28854721

Table 4.3-9. Income Requirements (continue).

	10 Manufacturing	11 Transportation and Communications	12 Utilities	13 Trade	14 Eating, Drinking, and Lodging	15 Finance, Insurance, and Real Estate	16 Services	17 Hotels, Gaming, and Recreation	18 Health	19 Local Government	20 Households
1	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
2	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
3	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
4	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
5	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
6	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
7	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
8	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
9	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
10	0.26369049	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
11	0.00000000	0.40103999	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
12	0.00000000	0.00000000	0.12544132	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
13	0.00000000	0.00000000	0.00000000	0.48690061	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
14	0.00000000	0.00000000	0.00000000	0.00000000	0.33365810	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
15	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.13871607	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
16	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.39651269	0.00000000	0.00000000	0.00000000	0.00000000
17	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.32280030	0.00000000	0.00000000	0.00000000
18	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.42231663	0.00000000	0.00000000
19	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.37108700	0.00000000
20	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
	0.26369049	0.40103999	0.12544132	0.48690061	0.33365810	0.13871607	0.39651269	0.32280030	0.42231663	0.37108700	0.00000000

Table 4.3-10. Total Income Requirements.

Economic Sector	1 Livestock Production	2 Dairy Production	3 Alfalfa Hay Production	4 Other Hay Production	5 Barley Production	6 Agricultural Services	7 Gold Mining	8 Other Mining	9 Construction
1 Livestock Production	0.20510671	0.00001941	0.00001462	0.00001669	0.00001496	0.00002012	0.00001715	0.00001035	0.00002299
2 Dairy Production	0.00007231	0.22523291	0.00000400	0.00000664	0.00000664	0.00000905	0.00000794	0.00000363	0.00001190
3 Alfalfa Hay Production	0.00001334	0.02880975	0.40625685	0.00000639	0.00000522	0.00000686	0.00000561	0.00000430	0.00000660
4 Other Hay Production	0.04239899	0.00000826	0.00001020	0.37858108	0.00000795	0.00001049	0.00000863	0.00000646	0.00001030
5 Barley Production	0.00023605	0.00000037	0.00000066	0.00000040	0.30555585	0.00000047	0.00000050	0.00000033	0.00000052
6 Agricultural Services	0.00865949	0.00378148	0.03209809	0.00407012	0.00023762	0.42394277	0.00033398	0.00017890	0.00079281
7 Gold Mining	0.00004092	0.00004213	0.00005594	0.00002845	0.00002354	0.00059572	0.31218285	0.00027975	0.00004295
8 Other Mining	0.00003226	0.00004027	0.00001636	0.00002555	0.00002529	0.00004942	0.00004552	0.26051553	0.00004725
9 Construction	0.00859127	0.00707530	0.00748641	0.00674150	0.00395850	0.00804642	0.00722020	0.01916715	0.34246243
10 Manufacturing	0.01485355	0.01874199	0.00668590	0.01163897	0.01173273	0.01598473	0.01399451	0.00627842	0.02116515
11 Transportation and Communications	0.01182878	0.01356746	0.01045697	0.01153596	0.00678499	0.01336020	0.01281337	0.00873700	0.01278829
12 Utilities	0.00345191	0.00351874	0.00665033	0.00478063	0.00236463	0.00414888	0.01034648	0.01041813	0.00355220
13 Trade	0.04498432	0.03040965	0.05896043	0.05236535	0.06119825	0.03404076	0.02329201	0.02729796	0.05247971
14 Eating, Drinking, and Lodging	0.00517087	0.00481173	0.00838690	0.00693460	0.00547927	0.00693331	0.00721872	0.00484901	0.00633301
15 Finance, Insurance, and Real Estate	0.01575185	0.01308047	0.02094452	0.01905294	0.01600054	0.01246295	0.01610267	0.00976291	0.01266829
16 Services	0.03005305	0.02871522	0.07344052	0.03796879	0.02570846	0.04312867	0.04843860	0.03353961	0.04504476
17 Hotels, Gaming, and Recreation	0.00430143	0.00405892	0.00686233	0.00592336	0.00464190	0.00605236	0.00486098	0.00412706	0.00530433
18 Health	0.01187966	0.01118552	0.01897101	0.01635778	0.01276201	0.01666345	0.01342383	0.01155153	0.01461231
19 Local Government	0.02179989	0.01192793	0.02747045	0.03504019	0.00669373	0.01849115	0.01474983	0.01509910	0.01195806
20 Households	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
Column Total	0.42922663	0.40502749	0.68477251	0.59107539	0.46320209	0.60394778	0.48506340	0.41182713	0.52930388

Table 4.3-10. Total Income Requirements (continue).

	10 Manufacturing	11 Transportation and Communications	12 Utilities	13 Trade	14 Eating, Drinking, and Lodging	15 Finance, Insurance, and Real Estate	16 Services	17 Hotels, Gaming, and Recreation	18 Health	19 Local Government	20 Households
1	0.00021914	0.00001452	0.00000726	0.00001688	0.00001392	0.00000747	0.00001866	0.00001387	0.00001729	0.00001547	0.00002309
2	0.00015971	0.00000501	0.00000321	0.00000578	0.00000544	0.00000289	0.00000585	0.00000542	0.00000654	0.00000497	0.00000509
3	0.00002751	0.00000609	0.00000252	0.00000712	0.00000539	0.00000286	0.00000623	0.00000538	0.00000681	0.00000680	0.00001212
4	0.00004967	0.00000913	0.00000384	0.00001068	0.00000813	0.00000434	0.00001003	0.00000811	0.00001028	0.00001015	0.00001780
5	0.00000227	0.00000049	0.00000018	0.00000055	0.00000037	0.00000028	0.00000383	0.00000035	0.00000054	0.00000049	0.00000057
6	0.00017974	0.00020353	0.00012352	0.00031010	0.00019945	0.00220032	0.00026102	0.00013860	0.00028809	0.00027409	0.00027671
7	0.00057226	0.00001736	0.00001138	0.00002013	0.00001907	0.00001285	0.00001720	0.00001895	0.00002288	0.00001726	0.00001718
8	0.00060986	0.00001899	0.00002512	0.00002211	0.00002115	0.00001123	0.00001916	0.00002104	0.00003191	0.00001922	0.00001924
9	0.00683745	0.01131494	0.01601302	0.00795304	0.00637544	0.01950919	0.01106180	0.00502086	0.00903143	0.03318159	0.00661737
10	0.28901935	0.00863526	0.00565806	0.00996383	0.00950315	0.00501239	0.00851567	0.00947909	0.01136436	0.00853374	0.00849479
11	0.01543666	0.42620124	0.00991905	0.01723655	0.01045109	0.00828817	0.01588735	0.00998483	0.01437041	0.01282666	0.01459426
12	0.00559360	0.00342558	0.14120505	0.00634569	0.00807451	0.00309914	0.00547857	0.00500812	0.00517140	0.00618921	0.00493616
13	0.02618897	0.02886854	0.01161310	0.51870645	0.04896172	0.01473545	0.03044647	0.02712953	0.03752522	0.04390122	0.05375981
14	0.00493050	0.01048629	0.00306551	0.01061332	0.33957651	0.00593576	0.01250020	0.00567684	0.00758101	0.00769755	0.01351014
15	0.00865962	0.01175251	0.00486272	0.01861966	0.01274833	0.15997567	0.01466792	0.00854688	0.01876110	0.01455251	0.01741359
16	0.03412851	0.05133124	0.01617393	0.05757822	0.03627662	0.02881937	0.45628474	0.03411568	0.05550689	0.05069412	0.06009114
17	0.00418283	0.00585799	0.00223980	0.00686856	0.00502191	0.00267045	0.00590146	0.34247484	0.00640543	0.00664878	0.01245265
18	0.01155508	0.01612596	0.00616653	0.01891438	0.01381907	0.00772785	0.01703111	0.02823663	0.46100544	0.01941190	0.03415259
19	0.00903955	0.01027731	0.00640966	0.01220094	0.01004062	0.00846071	0.01077198	0.02430782	0.01207263	0.45947703	0.01621915
20	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
	0.41739228	0.58455197	0.22350346	0.68539401	0.50112190	0.26647639	0.58888924	0.50019285	0.63917968	0.66346276	0.24261346

Multipliers

Multipliers for final demand, output, employment, and income are shown in Table 4.3-11.

Final demand multipliers show the total dollar amount of change in total economic activity from a one dollar change in final demand of a given sector.

Output multipliers show the total dollar amount of change in total economic activity from a one dollar change in output of a given sector.

Employment multipliers show the total change in the number of jobs from a single job change of a given sector.

Income multipliers show the total dollar amount of change in income from a one dollar change in income of a given sector.

Table 4.3-11. Multipliers.

Economic Sector	Final Demand Multiplier \$	Output Multiplier \$	Employment /1 Multiplier jobs	Income /1 Multiplier \$
1 Livestock Production	2.37181331	1.87085597	1.90478143	2.65305922
2 Dairy Production	1.95901623	1.95699048	1.43683842	1.80012219
3 Alfalfa Hay Production	2.51474055	2.51469813	1.88779391	1.68559387
4 Other Hay Production	2.24896056	2.24890326	1.67085221	1.56133122
5 Barley Production	1.94345518	1.94345328	1.32262396	1.51593410
6 Agricultural Services	2.16126301	2.15655122	1.39772153	1.42771001
7 Gold Mining	2.07360180	2.07341476	1.34668530	1.55391991
8 Other Mining	1.91641888	1.91392950	1.51787242	1.58287214
9 Construction	2.27451846	1.91643197	2.39925602	1.83437532
10 Manufacturing	1.90924436	1.74192345	1.99242059	1.58288712
11 Transportation and Communications	2.13681463	2.01066547	1.87103488	1.45759024
12 Utilities	1.59926976	1.42073187	1.79351823	1.78173709
13 Trade	2.32154772	2.17919595	1.46230428	1.40766719
14 Eating, Drinking, and Lodging	2.02795308	1.99260830	1.50437558	1.50190240
15 Finance, Insurance, and Real Estate	1.72745799	1.49789140	1.64701348	1.92102031
16 Services	2.18843808	1.90175871	1.38866357	1.48517123
17 Hotels, Gaming, and Recreation	2.03316211	1.91636074	1.54102120	1.54954268
18 Health	2.31132517	2.11735261	1.44040138	1.51350818
19 Local Government	2.54447284	2.05499020	1.87744348	1.78789008
20 Households	1.96687119	1.58132249		

1. Employment and income multipliers are ratio multipliers. The ratio multiplier for employment is the total employment requirements to employment requirements. Similarly, the ratio multiplier for income is the total income requirements to income requirements.

5. Model Application

Two applications are performed by the regional economic impact model. The first application is the estimation of the economic impacts for alternative reservoir storage levels. The second application is the estimation of the economic impacts for reallocations of water. These two applications are performed with the aid of a computer program.

5.1. Estimation of the Economic Impacts for Alternative Reservoir Storage Levels

Estimation of the economic impacts for alternative reservoir storage levels at Prosser, Stampede, and Boca Reservoirs is done by integrating the recreation model component with the input-output model component. A direct economic impact is calculated first using the recreation model component. Then second, the total economic impact is calculated using the input-output model component. Third, the response economic impact is also calculated using the input-output model component.

Direct Economic Impact

The direct economic impact is the expenditures that camping and day use visitors at Prosser, Stampede, and Boca Reservoirs make in the regional economy during the year. Expenditures are on licenses, camping fees, hotel or motel, restaurant, groceries, equipment and supplies, rental, fuel, and other items.

Estimation of the direct economic impact is done through the following process. Using the recreation model component, the end of the month reservoir storage levels at Prosser, Stampede, and Boca Reservoirs is the input data. In turn, annual number of camping and day use visitors, annual camping and day use visitor expenditures, and, annual camping and day use visitor expenditures by category are calculated for each of the reservoirs. The total expenditures by category for all the reservoirs are then placed into economic sectors to become the direct economic impact. Underlying details of the recreation model component and equations used to calculate annual visitors, annual visitor expenditures, and annual visitor expenditures by category are given in Chapter 3.

End of the Month Reservoir Storage Levels

End of the month reservoir storage levels at Prosser, Stampede, and Boca Reservoirs are provided in Table 5.1-1.

End of the month reservoir storage levels for Prosser, Stampede, and Boca Reservoirs are given for April through October and Other Months. April through October is considered to be the recreation season in a given year. Other Months are January, February, March, November and December of the given year. The reservoir storage levels are taken in total for April through October and as an average for the Other Months.

End of the month reservoir storage levels for Prosser, Stampede, and Boca Reservoirs also have a set range of storage level. Reservoir storage levels at Prosser Reservoir can only range between 11,000 acre-feet and 29,840 acre-feet. Reservoir storage levels at Stampede Reservoir can only range between 80,000 acre-feet and 226,000 acre-feet. Reservoir storage levels at Boca Reservoir can only range between less than 22,000 acre-feet to 41,100 acre-feet.

Annual Number of Camping and Day Use Visitors

Annual number of camping and day use visitors by month by reservoir are provided in Table 5.1-2.

Annual Camping and Day Use Visitor Expenditures

Annual camping and day use visitor expenditures by month by reservoir are provided in Table 5.1-3.

Annual Camping and Day Use Visitor Expenditures by Category

Annual camping and day use visitor expenditures by category by reservoir are provided in Table 5.1-4.

Direct Economic Impact

The direct economic impact by economic sector is provided in Table 5.1-5. The total expenditures by category for the reservoirs are placed into economic sectors. The direct impact is presented as total direct expenditures.

There are twenty economic sectors within the regional economy. These sectors include livestock production, dairy production, alfalfa hay production, other hay production, barley production, agricultural services, gold mining, other mining, construction, manufacturing, transportation and communications, utilities, trade, eating, drinking, and lodging, finance, insurance, and real estate, services, hotels, gaming, and recreation, health, local government, and households. In addition to these sectors, there is also other final payments and imports.

The trade sector accounts for expenditure categories of groceries, equipment and supplies, fuel, and other. The eating, drinking, and lodging sector accounts for the expenditure categories of hotel or motel, restaurant, and rental. Other final payments account for expenditure categories of camping fees and license fees.

The total direct expenditures are trade, eating, drinking, and lodging sector expenditures, other final payments, and imports. Other final payments and imports are leakage's out of the regional economy. Other final payments are expenditures to the federal and state government. Imports make-up the balance of the marginalized trade sector expenditures. The trade sector expenditures are marginalized to 25% to reflect that only the mark-up value on goods sold remains in the regional economy.

Table 5.1-1. End of the Month Reservoir Storage Levels.

Month	Prosser Reservoir <i>acre-feet</i>	Stampede Reservoir <i>acre-feet</i>	Boca Reservoir <i>acre-feet</i>
April	9,767	80,186	26,763
May	16,414	113,577	37,473
June	20,957	166,955	38,557
July	22,110	177,424	38,084
August	21,691	174,288	34,582
September	14,394	172,442	23,927
October	10,050	170,696	16,419
Other Months Average	9,854	113,263	9,561
January	9,827	73,944	5,247
February	9,723	75,751	4,396
March	9,642	76,677	2,955
November	9,981	170,433	17,042
December	10,098	169,510	18,163

Table 5.1-2. Annual Number of Camping and Day Use Visitors by Month by Reservoir.

Month	Prosser Reservoir <i>visitors</i>	Stampede Reservoir <i>visitors</i>	Boca Reservoir <i>visitors</i>	Total <i>visitors</i>
April	12,592	8,653	11,977	33,223
May	12,592	13,845	23,955	50,392
June	12,592	21,633	30,799	65,024
July	16,789	22,499	35,932	75,220
August	25,184	39,806	39,354	104,344
September	12,592	17,307	26,521	56,420
October	12,592	8,653	16,255	37,500
Other Months	4,197	0	5,133	9,330
Total	109,131	132,397	189,926	431,453

Table 5.1-3. Annual Camping and Day Use Visitor Expenditures by Month by Reservoir.

Month	Prosser Reservoir \$	Stampede Reservoir \$	Boca Reservoir \$	Total \$
April	501,846	187,456	116,053	805,355
May	501,846	299,930	232,106	1,033,882
June	501,846	468,641	298,422	1,268,909
July	669,128	487,386	348,159	1,504,673
August	1,003,692	862,299	381,317	2,247,308
September	501,846	374,913	256,975	1,133,733
October	501,846	187,456	157,501	846,803
Other Months	167,282	0	49,737	217,019
Total	4,349,330	2,868,081	1,840,270	9,057,681

Table 5.1-4. Annual Camping and Day Use Visitor Expenditures by Category by Reservoir.

Category	Prosser Reservoir \$	Stampede Reservoir \$	Boca Reservoir \$	Total \$
Licenses	469,597	808,452	199,008	1,477,057
Camping Fees	0	131,926	81,564	213,490
Hotel or Motel	11,323	316,855	364,142	692,319
Restaurant	471,812	320,405	141,289	933,506
Groceries	1,002,959	635,186	553,294	2,191,439
Equipment and Supplies	55,570	115,506	66,349	237,425
Rental	1,839,920	0	0	1,839,920
Fuel	359,589	510,045	288,049	1,157,683
Other	138,560	29,705	146,576	314,841
Total	4,349,330	2,868,081	1,840,270	9,057,681

Table 5.1-5. Direct Economic Impact by Economic Sector.

Economic Sector	Total Direct Expenditures \$
1 Livestock Production	0
2 Dairy Production	0
3 Alfalfa Hay Production	0
4 Other Hay Production	0
5 Barley Production	0
6 Agricultural Services	0
7 Gold Mining	0
8 Other Mining	0
9 Construction	0
10 Manufacturing	0
11 Transportation and Communications	0
12 Utilities	0
13 Trade	994,854
14 Eating, Drinking, and Lodging	3,465,746
15 Finance, Insurance, and Real Estate	0
16 Services	0
17 Hotels, Gaming, and Recreation	0
18 Health	0
19 Local Government	0
20 Households	0
Other Final Payments	1,690,547
Imports	2,906,534
Total	9,057,681

Total Economic Impact

The total economic impact is the total amount of economic activity in terms of output generated from the direct economic impact.

The total economic impact includes the direct economic impact plus indirect and induced economic impacts. The direct economic impact is the expenditures accounted for in the trade, and, eating, drinking, and lodging sectors. The indirect economic impact is the additional impact that occurs due to linkages that the trade, and, eating, drinking, and lodging sectors have with each other and with the other economic sectors in the regional economy, except for local government and households sectors. The induced economic impact is the additional impact that occurs due to linkages that the trade, and, eating, drinking, and lodging sectors have with the local government and households sectors.

Estimation of the total economic impact is done through the following process. The direct economic impact by economic sector is the input data. In turn, using the input-output model component, the direct economic impact by economic sector is post-multiplied by the output requirements to become the total economic impact. Underlying details of the input-output model component and output requirements are given in Chapter 4.

Total Economic Impact

The total economic impact by economic sector is provided in Table 5.1-6. The total economic impact is presented as total output and adjusted output. The adjusted output is net of agriculture production and mining sectors. The reason for this is because the agriculture production and mining sectors have a fixed resource base.

Table 5.1-6. Total Economic Impact by Economic Sector.

Economic Sector	Total Output \$	Adjusted /1 Output \$
1 Livestock Production	390	0
2 Dairy Production	106	0
3 Alfalfa Hay Production	62	0
4 Other Hay Production	99	0
5 Barley Production	6	0
6 Agricultural Services	2,290	2,290
7 Gold Mining	268	0
8 Other Mining	356	0
9 Construction	100,980	100,980
10 Manufacturing	158,012	158,012
11 Transportation and Communications	128,880	128,880
12 Utilities	266,439	266,439
13 Trade	1,337,288	1,337,288
14 Eating, Drinking, and Lodging	3,495,451	3,495,451
15 Finance, Insurance, and Real Estate	438,308	438,308
16 Services	447,158	447,158
17 Hotels, Gaming, and Recreation	72,849	72,849
18 Health	153,254	153,254
19 Local Government	122,843	122,843
20 Households	2,348,815	2,346,220
Other Final Payments	1,690,547	1,690,547
Imports	2,906,534	2,906,534
Total	13,670,937	13,667,054

1. Adjusted output is net of agriculture production and mining sectors.

Response Economic Impact

The response economic impact includes the employment response, income response, population response, housing response, agriculture water use response, commercial water use response, and residential water use response to the total economic impact.

Estimation of the response economic impact is done through the following process. The total economic impact by economic sector is the input data. In turn, using the input-output model component, the total economic impact by economic sector is multiplied by the output response coefficients by economic sector to become the response economic impact. Output response coefficients are given for employment, income, population, housing, agriculture water use, commercial water use, and residential water use. Underlying details of the input-output model component and output response coefficients are given in Chapter 4.

Employment Response

Employment response by economic sector is provided in Table 5.1-7. Employment is measured as jobs.

Income Response

Income response by economic sector is provided in Table 5.1-8. Income is measured in dollars.

Population Response

Population response by economic sector is provided in Table 5.1-9. Population is measured as all persons.

Housing Response

Housing response by economic sector is provided in Table 5.1-10. Housing is measured as dwellings.

Agriculture Water Use Response

Agriculture water use response by economic sector is provided in Table 5.1-11. Agriculture water use is measured in acre-feet.

Commercial Water Use Response

Commercial water use response by economic sector is provided in Table 5.1-12. Commercial water use is measured in acre-feet and in gallons.

Residential Water Use Response

Residential water use response by economic sector is provided in Table 5.1-13. Residential water use is measured in acre-feet and in gallons.

Table 5.1-7. Employment Response by Economic Sector.

Economic Sector	Employment jobs
1 Livestock Production	0
2 Dairy Production	0
3 Alfalfa Hay Production	0
4 Other Hay Production	0
5 Barley Production	0
6 Agricultural Services	0
7 Gold Mining	0
8 Other Mining	0
9 Construction	1
10 Manufacturing	1
11 Transportation and Communications	2
12 Utilities	2
13 Trade	34
14 Eating, Drinking, and Lodging	66
15 Finance, Insurance, and Real Estate	5
16 Services	13
17 Hotels, Gaming, and Recreation	1
18 Health	4
19 Local Government	2
20 Households	0
Total	131

Table 5.1-8. Income Response by Economic Sector.

Economic Sector	Income \$
1 Livestock Production	0
2 Dairy Production	0
3 Alfalfa Hay Production	0
4 Other Hay Production	0
5 Berley Production	0
6 Agricultural Services	969
7 Gold Mining	0
8 Other Mining	0
9 Construction	29,138
10 Manufacturing	41,666
11 Transportation and Communications	51,686
12 Utilities	33,422
13 Trade	651,126
14 Eating, Drinking, and Lodging	1,166,285
15 Finance, Insurance, and Real Estate	60,800
16 Services	177,304
17 Hotels, Gaming, and Recreation	23,516
18 Health	64,722
19 Local Government	45,586
20 Households	0
Total	2,346,220

Table 5.1-9. Population Response by Economic Sector.

Economic Sector	Population <i>all persons</i>
1 Livestock Production	0
2 Dairy Production	0
3 Alfalfa Hay Production	0
4 Other Hay Production	0
5 Barley Production	0
6 Agricultural Services	0
7 Gold Mining	0
8 Other Mining	0
9 Construction	2
10 Manufacturing	2
11 Transportation and Communications	2
12 Utilities	3
13 Trade	55
14 Eating, Drinking, and Lodging	118
15 Finance, Insurance, and Real Estate	8
16 Services	21
17 Hotels, Gaming, and Recreation	2
18 Health	7
19 Local Government	4
20 Households	0
Total	224

Table 5.1-10. Housing Response by Economic Sector.

Economic Sector	Housing dwellings
1 Livestock Production	0
2 Dairy Production	0
3 Alfalfa Hay Production	0
4 Other Hay Production	0
5 Barley Production	0
6 Agricultural Services	0
7 Gold Mining	0
8 Other Mining	0
9 Construction	1
10 Manufacturing	1
11 Transportation and Communications	1
12 Utilities	1
13 Trade	22
14 Eating, Drinking, and Lodging	46
15 Finance, Insurance, and Real Estate	3
16 Services	8
17 Hotels, Gaming, and Recreation	1
18 Health	3
19 Local Government	1
20 Households	0
Total	88

Table 5.1-11. Agriculture Water Use Response by Economic Sector.

Economic Sector	Agriculture Water Use <i>acre-feet</i>
1 Livestock Production	0
2 Dairy Production	0
3 Alfalfa Hay Production	0
4 Other Hay Production	0
5 Barley Production	0
6 Agricultural Services	0
7 Gold Mining	0
8 Other Mining	0
9 Construction	0
10 Manufacturing	0
11 Transportation and Communications	0
12 Utilities	0
13 Trade	0
14 Eating, Drinking, and Lodging	0
15 Finance, Insurance, and Real Estate	0
16 Services	0
17 Hotels, Gaming, and Recreation	0
18 Health	0
19 Local Government	0
20 Households	0
Total	0

Table 5.1-12. Commercial Water Use Response by Economic Sector.

Economic Sector	Commercial Water Use <i>acre-feet</i>	Commercial Water Use <i>gallons</i>
1 Livestock Production	0	0
2 Dairy Production	0	0
3 Alfalfa Hay Production	0	0
4 Other Hay Production	0	0
5 Barley Production	0	0
6 Agricultural Services	0	913
7 Gold Mining	0	0
8 Other Mining	0	0
9 Construction	0	5,464
10 Manufacturing	0	17,067
11 Transportation and Communications	0	15,874
12 Utilities	0	124,305
13 Trade	1	407,116
14 Eating, Drinking, and Lodging	7	2,313,169
15 Finance, Insurance, and Real Estate	0	35,285
16 Services	1	236,863
17 Hotels, Gaming, and Recreation	0	79,977
18 Health	0	123,301
19 Local Government	0	17,220
20 Households	0	0
Total	10	3,376,554

Table 5.1-13. Residential Water Use Response by Economic Sector.

Economic Sector	Residential /1 Water Use <i>acre-feet</i>	Residential /1 Water Use <i>gallons</i>
1 Livestock Production	0	0
2 Dairy Production	0	0
3 Alfalfa Hay Production	0	0
4 Other Hay Production	0	0
5 Barley Production	0	0
6 Agricultural Services	0	7,413
7 Gold Mining	0	0
8 Other Mining	0	0
9 Construction	0	116,755
10 Manufacturing	1	165,485
11 Transportation and Communications	1	186,539
12 Utilities	1	202,728
13 Trade	13	4,188,676
14 Eating, Drinking, and Lodging	27	8,955,406
15 Finance, Insurance, and Real Estate	2	630,997
16 Services	5	1,609,741
17 Hotels, Gaming, and Recreation	1	167,504
18 Health	2	561,356
19 Local Government	1	278,939
20 Households	0	0
Total	52	17,071,539

1. Residential water use is non-metered residential water use.

Summary

A summary is provided in Table 5.1-14. This summary includes average end of the month reservoir storage for the reservoirs, camping and day use visitors for the reservoirs, direct economic impact, total economic impact, employment response, income response, population response, housing response, agriculture water use response, commercial water use response, residential water use response, and a recreation expenditure multiplier.

Table 5.1-14. Summary.

Prosser Reservoir Average End of the Month Reservoir Storage	15,655 <i>acre-feet</i>
Stampede Reservoir Average End of the Month Reservoir Storage	146,104 <i>acre-feet</i>
Boca Reservoir Average End of the Month Reservoir Storage	28,171 <i>acre-feet</i>
Prosser Reservoir Camping and Day Use Visitors	109,131 <i>visitors</i>
Stampede Reservoir Camping and Day Use Visitors	132,397 <i>visitors</i>
Boca Reservoir Camping and Day Use Visitors	189,926 <i>visitors</i>
Direct Economic Impact	9,057,681 <i>\$s of expenditure</i>
Total Economic Impact	13,667,054 <i>\$s of output</i>
Employment Response	131 <i>jobs</i>
Income Response	2,346,220 <i>\$s of income</i>
Population Response	224 <i>all persons</i>
Housing Response	88 <i>dwellings</i>
Agriculture Water Use Response	0 <i>acre-feet</i>
Commercial Water Use Response	10 <i>acre-feet</i>
Residential Water Use Response /1	52 <i>acre-feet</i>
Recreation Expenditure Multiplier /2	1.50889099

1. Residential water use is non-metered residential water use.

2. Recreation expenditure multiplier is a ratio multiplier. The recreation expenditure multiplier is the total economic impact to direct economic impact.
Multiplier interpretation: a \$1 expenditure creates an additional \$1.51 in economic activity.

5.2. Estimation of the Economic Impacts for Reallocations of Water

Estimation of the economic impacts for reallocations of water is done entirely with the input-output model component. Reallocations of water include an agriculture water transfer and a commercial water transfer. A direct economic impact, a total economic impact, and a response economic impact are calculated separately for each water transfer using the input-output model component.

Direct Economic Impact

The direct economic impact for an agriculture water transfer and for a commercial water transfer is output.

Estimation of the direct economic impact is done through the following process. Using the input-output model component, the water transfer amount for an agriculture water transfer and for a commercial water transfer is the input data. In turn, the water transfer amount is multiplied by water transfer coefficients for agriculture water use and for commercial water use. Water transfer coefficients distribute the water transfer amount by economic sector in the regional economy. The water transfer amount by economic sector for a agriculture water transfer and for a commercial water transfer is then divided by output response coefficients by economic sector for agriculture water use and for commercial water use to become the direct economic impact. Underlying details of the input-output model component and output response coefficients are given in Chapter 4.

Water Transfer

The water transfer amount for an agriculture water transfer and for a commercial water transfer is provided in Table 5.2-1. The water transfer amount is measured in acre-feet.

Water transfer coefficients for agriculture water use and for commercial water use are provided in Table 5.2-2. These coefficients reflect a water transfer pattern by economic sector in the regional economy.

There are twenty economic sectors within the regional economy. These sectors include livestock production, dairy production, alfalfa hay production, other hay production, barley production, agricultural services, gold mining, other mining, construction, manufacturing, transportation and communications, utilities, trade, eating, drinking, and lodging, finance, insurance, and real estate, services, hotels, gaming, and recreation, health, local government, and households.

The water transfer amount by economic sector for an agriculture water transfer and for a commercial water transfer is provided in Table 5.2-3. An agriculture water transfer affects the livestock production sector. A commercial water transfer affects the manufacturing, and, hotels, gaming, and recreation sectors.

Direct Economic Impact

The direct economic impact by economic sector for an agriculture water transfer and for a commercial water transfer is provided in Table 5.2-4. Again, the direct economic impact is output.

Table 5.2-1. Water Transfer Amount.

	Agriculture Water Transfer	Commercial Water Transfer
Water Transfer Amount	34,909 acre-feet	8,853 acre-feet

Table 5.2-2. Water Transfer Coefficients by Economic Sector.

Economic Sector	Agriculture Water Transfer	Commercial Water Transfer
	Agriculture Water Use	Commercial Water Use
1 Livestock Production	1.0000000	0.0000000
2 Dairy Production	0.0000000	0.0000000
3 Alfalfa Hay Production	0.0000000	0.0000000
4 Other Hay Production	0.0000000	0.0000000
5 Barley Production	0.0000000	0.0000000
6 Agricultural Services	0.0000000	0.0000000
7 Gold Mining	0.0000000	0.0000000
8 Other Mining	0.0000000	0.0000000
9 Construction	0.0000000	0.0000000
10 Manufacturing	0.0000000	0.08966279
11 Transportation and Communications	0.0000000	0.0000000
12 Utilities	0.0000000	0.0000000
13 Trade	0.0000000	0.0000000
14 Eating, Drinking, and Lodging	0.0000000	0.0000000
15 Finance, Insurance, and Real Estate	0.0000000	0.0000000
16 Services	0.0000000	0.0000000
17 Hotels, Gaming, and Recreation	0.0000000	0.91033721
18 Health	0.0000000	0.0000000
19 Local Government	0.0000000	0.0000000
20 Households	0.0000000	0.0000000
Total	1.0000000	1.0000000

Table 5.2-3. Water Transfer Amount by Economic Sector.

Economic Sector	Agriculture Water Transfer	Commercial Water Transfer
	Water Transfer Amount <i>acre-feet</i>	Water Transfer Amount <i>acre-feet</i>
1 Livestock Production	34,909	0
2 Dairy Production	0	0
3 Alfalfa Hay Production	0	0
4 Other Hay Production	0	0
5 Barley Production	0	0
6 Agricultural Services	0	0
7 Gold Mining	0	0
8 Other Mining	0	0
9 Construction	0	0
10 Manufacturing	0	794
11 Transportation and Communications	0	0
12 Utilities	0	0
13 Trade	0	0
14 Eating, Drinking, and Lodging	0	0
15 Finance, Insurance, and Real Estate	0	0
16 Services	0	0
17 Hotels, Gaming, and Recreation	0	8,059
18 Health	0	0
19 Local Government	0	0
20 Households	0	0
Total	34,909	8,853

Table 5.2-4. Direct Economic Impact by Economic Sector.

Economic Sector	Agriculture Water Transfer	Commercial Water Transfer
	Output \$	Output \$
1 Livestock Production	2,124,370	0
2 Dairy Production	0	0
3 Alfalfa Hay Production	0	0
4 Other Hay Production	0	0
5 Barley Production	0	0
6 Agricultural Services	0	0
7 Gold Mining	0	0
8 Other Mining	0	0
9 Construction	0	0
10 Manufacturing	0	2,394,682,714
11 Transportation and Communications	0	0
12 Utilities	0	0
13 Trade	0	0
14 Eating, Drinking, and Lodging	0	0
15 Finance, Insurance, and Real Estate	0	0
16 Services	0	0
17 Hotels, Gaming, and Recreation	0	2,392,060,337
18 Health	0	0
19 Local Government	0	0
20 Households	0	0
Total	2,124,370	4,786,743,051

Total Economic Impact

The total economic impact for an agriculture water transfer and for a commercial water transfer is the total amount of economic activity in terms of output generated from the direct economic impact.

The total economic impact includes the direct economic impact plus indirect and induced economic impacts. The direct economic impact is the output accounted for in the livestock production sector for an agriculture water transfer and in the manufacturing, and, hotel, gaming, and recreation sectors for a commercial water transfer. The indirect economic impact is the additional impact that occurs due to linkages that the livestock production sector and manufacturing, hotels, gaming, and recreation sectors have with each other and with the other economic sectors in the regional economy, except for local government and households sectors. The induced economic impact is the additional impact that occurs due to linkages that the livestock production sector and manufacturing, hotels, gaming, and recreation sectors have with the local government and households sectors.

Estimation of the total economic impact is done through the following process. The direct economic impact by economic sector for an agriculture water transfer and for a commercial water transfer is the input data. In turn, using the input-output model component, the direct economic impact by economic sector is post-multiplied by the output requirements to become the total economic impact. Underlying details of the input-output model component and output requirements are given in Chapter 4.

Total Economic Impact

The total economic impact by economic sector for an agriculture water transfer and for a commercial water transfer is provided in Table 5.2-5. The total economic impact is presented as total output and adjusted output. The adjusted output for the agriculture water transfer is net of the mining sectors. The adjusted output for a commercial water transfer is net of the agriculture production and mining sectors. The reason for this is because the agriculture production and mining sectors have a fixed resource base.

Table 5.2-5. Total Economic Impact by Economic Sector.

Economic Sector	Agriculture Water Transfer		Commercial Water Transfer	
	Total Output \$	Adjusted /1 Output \$	Total Output \$	Adjusted /2 Output \$
1 Livestock Production	2,124,370	2,124,370	3,152,581	0
2 Dairy Production	539	539	1,605,169	0
3 Alfalfa Hay Production	55	55	177,800	0
4 Other Hay Production	187,671	187,671	334,969	0
5 Berley Production	1,294	1,294	18,863	0
6 Agricultural Services	34,302	34,302	1,667,047	1,667,047
7 Gold Mining	220	0	4,142,148	0
8 Other Mining	208	0	5,303,547	0
9 Construction	49,892	49,892	91,003,566	91,003,566
10 Manufacturing	94,390	94,390	2,475,732,106	2,475,732,106
11 Transportation and Communications	49,425	49,425	140,231,732	140,231,732
12 Utilities	46,111	46,111	187,438,371	187,438,371
13 Trade	154,814	154,814	243,141,052	243,141,052
14 Eating, Drinking, and Lodging	25,969	25,969	70,645,612	70,645,612
15 Finance, Insurance, and Real Estate	190,281	190,281	275,309,552	275,309,552
16 Services	127,005	127,005	382,038,837	382,038,837
17 Hotels, Gaming, and Recreation	22,329	22,329	2,420,371,102	2,420,371,102
18 Health	47,136	47,136	210,527,420	210,527,420
19 Local Government	98,439	98,439	200,910,260	200,910,260
20 Households	719,940	719,122	2,041,652,781	2,035,933,140
Total	3,974,391	3,973,146	8,755,404,515	8,734,949,797

1. Adjusted output is net of mining sectors.

2. Adjusted output is net of agriculture production and mining sectors.

Response Economic Impact

The response economic impact for an agriculture water transfer and for a commercial water transfer includes the employment response, income response, population response, housing response, agriculture water use response, commercial water use response, and residential water use response to the total economic impact.

Estimation of the response economic impact is done through the following process. The total economic impact by economic sector for an agriculture water transfer and for a commercial water transfer is the input data. In turn, using the input-output model component, the total economic impact by economic sector is multiplied by the output response coefficients by economic sector to become the response economic impact. Output response coefficients are given for employment, income, population, housing, agriculture water use, commercial water use, and residential water use. Underlying details of the input-output model component and output response coefficients are given in Chapter 4.

Employment Response

Employment response by economic sector for an agriculture water transfer and for a commercial water transfer is provided in Table 5.2-6. Employment is measured as jobs.

Income Response

Income response by economic sector for an agriculture water transfer and for a commercial water transfer is provided in Table 5.2-7. Income is measured in dollars.

Population Response

Population response by economic sector for an agriculture water transfer and for a commercial water transfer is provided in Table 5.2-8. Population is measured as all persons.

Housing Response

Housing response by economic sector for an agriculture water transfer and for a commercial water transfer is provided in Table 5.2-9. Housing is measured as dwellings.

Agriculture Water Use Response

Agriculture water use response by economic sector for an agriculture water transfer and for a commercial water transfer is provided in Table 5.2-10. Agriculture water use is measured in acre-feet.

Commercial Water Use Response

Commercial water use response by economic sector for an agriculture water transfer and for a commercial water transfer is provided in Table 5.2-11. Commercial water use is measured in acre-feet and in gallons.

Residential Water Use Response

Residential water use response by economic sector for an agriculture water transfer and a commercial water transfer is provided in Table 5.2-12. Residential water use is measured in acre-feet and in gallons.

Table 5.2-6. Employment Response by Economic Sector.

Economic Sector	Agriculture Water Transfer	Commercial Water Transfer
	Employment jobs	Employment jobs
1 Livestock Production	40	0
2 Dairy Production	0	0
3 Alfalfa Hay Production	0	0
4 Other Hay Production	3	0
5 Barley Production	0	0
6 Agricultural Services	1	43
7 Gold Mining	0	0
8 Other Mining	0	0
9 Construction	0	793
10 Manufacturing	1	20,425
11 Transportation and Communications	1	1,656
12 Utilities	0	1,173
13 Trade	4	6,134
14 Eating, Drinking, and Lodging	0	1,332
15 Finance, Insurance, and Real Estate	2	3,111
16 Services	4	11,053
17 Hotels, Gaming, and Recreation	0	45,571
18 Health	1	6,177
19 Local Government	2	3,554
20 Households	0	0
Total	60	101,022

Table 5.2-7. Income Response by Economic Sector.

Economic Sector	Agriculture Water Transfer	Commercial Water Transfer
	Income \$	Income \$
1 Livestock Production	343,692	0
2 Dairy Production	121	0
3 Alfalfa Hay Production	22	0
4 Other Hay Production	71,047	0
5 Barley Production	396	0
6 Agricultural Services	14,510	705,192
7 Gold Mining	0	0
8 Other Mining	0	0
9 Construction	14,396	26,258,825
10 Manufacturing	24,890	652,827,017
11 Transportation and Communications	19,821	56,238,533
12 Utilities	5,784	23,512,517
13 Trade	75,379	118,385,526
14 Eating, Drinking, and Lodging	8,665	23,571,481
15 Finance, Insurance, and Real Estate	26,395	38,189,860
16 Services	50,359	151,483,247
17 Hotels, Gaming, and Recreation	7,208	781,296,527
18 Health	19,906	88,909,231
19 Local Government	36,530	74,555,185
20 Households	0	0
Total	719,122	2,035,933,140

Table 5.2-8. Population Response by Economic Sector.

Economic Sector	Agriculture Water Transfer	Commercial Water Transfer
	Population <i>all persons</i>	Population <i>all persons</i>
1 Livestock Production	80	0
2 Dairy Production	0	0
3 Alfalfa Hay Production	0	0
4 Other Hay Production	7	0
5 Barley Production	0	0
6 Agricultural Services	1	70
7 Gold Mining	0	0
8 Other Mining	0	0
9 Construction	1	1,383
10 Manufacturing	1	33,868
11 Transportation and Communications	1	2,638
12 Utilities	0	1,851
13 Trade	6	9,916
14 Eating, Drinking, and Lodging	1	2,387
15 Finance, Insurance, and Real Estate	4	5,180
16 Services	6	17,912
17 Hotels, Gaming, and Recreation	1	72,281
18 Health	2	10,048
19 Local Government	3	5,969
20 Households	0	0
Total	115	163,502

Table 5.2-9. Housing Response by Economic Sector.

Economic Sector	Agriculture Water Transfer	Commercial Water Transfer
	Housing dwellings	Housing dwellings
1 Livestock Production	31	0
2 Dairy Production	0	0
3 Alfalfa Hay Production	0	0
4 Other Hay Production	3	0
5 Barley Production	0	0
6 Agricultural Services	1	28
7 Gold Mining	0	0
8 Other Mining	0	0
9 Construction	0	544
10 Manufacturing	1	13,421
11 Transportation and Communications	0	1,052
12 Utilities	0	739
13 Trade	3	3,944
14 Eating, Drinking, and Lodging	0	935
15 Finance, Insurance, and Real Estate	1	2,051
16 Services	2	7,122
17 Hotels, Gaming, and Recreation	0	28,835
18 Health	1	3,993
19 Local Government	1	2,361
20 Households	0	0
Total	45	65,026

Table 5.2-10. Agriculture Water Use Response by Economic Sector.

Economic Sector	Agriculture Water Transfer	Commercial Water Transfer
	Agriculture Water Use <i>acre-feet</i>	Agriculture Water Use <i>acre-feet</i>
1 Livestock Production	34,909	0
2 Dairy Production	0	0
3 Alfalfa Hay Production	1	0
4 Other Hay Production	5,042	0
5 Barley Production	26	0
6 Agricultural Services	0	0
7 Gold Mining	0	0
8 Other Mining	0	0
9 Construction	0	0
10 Manufacturing	0	0
11 Transportation and Communications	0	0
12 Utilities	0	0
13 Trade	0	0
14 Eating, Drinking, and Lodging	0	0
15 Finance, Insurance, and Real Estate	0	0
16 Services	0	0
17 Hotels, Gaming, and Recreation	0	0
18 Health	0	0
19 Local Government	0	0
20 Households	0	0
Total	39,977	0

Table 5.2-11. Commercial Water Use Response by Economic Sector.

Economic Sector	Agriculture Water Transfer		Commercial Water Transfer	
	Commercial Water Use <i>acre-feet</i>	Commercial Water Use <i>gallons</i>	Commercial Water Use <i>acre-feet</i>	Commercial Water Use <i>gallons</i>
1 Livestock Production	2	624,986	0	0
2 Dairy Production	0	184	0	0
3 Alfalfa Hay Production	0	16	0	0
4 Other Hay Production	0	52,262	0	0
5 Barley Production	0	561	0	0
6 Agricultural Services	0	13,680	2	664,842
7 Gold Mining	0	0	0	0
8 Other Mining	0	0	0	0
9 Construction	0	2,699	15	4,923,915
10 Manufacturing	0	10,195	821	267,412,358
11 Transportation and Communications	0	6,088	53	17,272,579
12 Utilities	0	21,513	268	87,448,018
13 Trade	0	47,131	227	74,020,431
14 Eating, Drinking, and Lodging	0	17,185	143	46,750,827
15 Finance, Insurance, and Real Estate	0	15,318	68	22,162,992
16 Services	0	67,276	621	202,368,686
17 Hotels, Gaming, and Recreation	0	24,514	8,155	2,657,208,939
18 Health	0	37,924	520	169,379,628
19 Local Government	0	13,799	86	28,163,833
20 Households	0	0	0	0
Total	3	955,330	10,980	3,577,777,048

Table 5.2-12. Residential Water Use Response by Economic Sector.

Economic Sector	Agriculture Water Transfer		Commercial Water Transfer	
	Residential /1 Water Use <i>acre-feet</i>	Residential /1 Water Use <i>gallons</i>	Residential /1 Water Use <i>acre-feet</i>	Residential /1 Water Use <i>gallons</i>
1 Livestock Production	14	4,528,986	0	0
2 Dairy Production	0	1,055	0	0
3 Alfalfa Hay Production	0	109	0	0
4 Other Hay Production	1	379,987	0	0
5 Barley Production	0	4,935	0	0
6 Agricultural Services	0	83,606	12	4,063,160
7 Gold Mining	0	0	0	0
8 Other Mining	0	0	0	0
9 Construction	0	43,422	243	79,201,461
10 Manufacturing	0	74,437	5,992	1,952,388,713
11 Transportation and Communications	0	53,883	469	152,882,355
12 Utilities	0	26,429	330	107,431,642
13 Trade	1	365,207	1,760	573,570,703
14 Eating, Drinking, and Lodging	0	50,071	418	136,213,006
15 Finance, Insurance, and Real Estate	1	206,264	916	298,434,724
16 Services	1	344,338	3,179	1,035,788,382
17 Hotels, Gaming, and Recreation	0	38,673	12,865	4,192,047,146
18 Health	0	130,028	1,782	580,752,065
19 Local Government	1	168,298	1,054	343,489,595
20 Households	0	0	0	0
Total	20	6,499,730	29,020	9,456,262,952

1. Residential water use is metered residential water use.

Summary

A summary for an agriculture water transfer and for a commercial water transfer is provided in Table 5.2-13. This summary includes water transfer amount, direct economic impact, total economic impact, employment response, income response, population response, housing response, agriculture water use response, commercial water use response, residential water use response, combined water use, and a water transfer multiplier.

Table 5.2-13. Summary.

	Agriculture Water Transfer	Commercial Water Transfer
Water Transfer Amount	34,909 acre-feet	8,853 acre-feet
Direct Economic Impact	2,124,370 \$s of output	4,786,743,051 \$s of output
Total Economic Impact	3,973,146 \$s of output	8,734,949,797 \$s of output
Employment Response	60 jobs	101,022 jobs
Income Response	719,122 \$s of income	2,035,933,140 \$s of income
Population Response	115 all persons	163,502 all persons
Housing Response	45 dwellings	65,026 dwellings
Agriculture Water Use Response	39,977 acre-feet	0 acre-feet
Commercial Water Use Response	3 acre-feet	10,980 acre-feet
Residential Water Use Response /1	20 acre-feet	29,020 acre-feet
Combined Water Use /2	40,000 acre-feet	40,000 acre-feet
Water Transfer Multiplier /3	1.14583167	4.51820020

1. Residential water use is metered residential water use.

2. Combined water use is the summation of agriculture water use, commercial water use, and residential water use.

3. Water transfer multiplier is a ratio multiplier. The water transfer multiplier is the combined water use to water transfer amount.

Multiplier interpretation: a 1 acre-foot agriculture water transfer requires an additional .15 acre-feet, and a 1 acre-foot commercial water transfer requires an additional 3.52 acre-feet.

6. Conclusion

The Truckee River Basin regional economic impact model has been developed following regional economic modeling procedures. An overview of this model, with respect to, model components, model applications, and model improvements, is presented here. Model components include a recreation model component and an input-output model component. Model applications include estimation of economic impacts for alternative reservoir storage levels and estimation of economic impacts for reallocations of water. Model improvements include supplement work to improve the recreation model component and model application for the estimation of the economic impacts for alternative reservoir storage levels. A description of the model components is given to describe tasks and model elements. This is followed by an explanation of the model applications to explain separate actions. A presentation of the model improvements is also given to introduce supplement work.

6.1. Description of the Model Components

The regional economic impact model has two model components. The first component is a recreation model component and the second component is an input-output model component.

Recreation Model Component

The recreation model component estimates the annual number of camping and day use visitors and the annual camping and day use visitor expenditures relative to the end of the month reservoir storage levels for each reservoir. Tasks performed to develop this component were survey of the visitation, estimation of the expenditure function, and formulation of the model equations. Model elements include end of the month reservoir storage levels, visitation and end of the month reservoir storage level relationships, annual patterns of visitation, annual number of camping and day use visitors, and annual camping and day use visitor expenditures. A summary of each task and model element is given below.

Survey of the Visitation

Surveys of the visitation and recreation use at river, lake, and reservoir sites on the Truckee River were done during August of 1993 and again during June, July, and August of 1994. These surveys were followed by separate surveys of the second-home owners and vacation-home renters in the Truckee area done during February of 1995. The purpose of the surveys were to, first, obtain an overall picture of the visitation and recreation activities occurring at the sites, second, quantify the amount of expenditures that visitors at the sites make to the local economy, and third, identify how the visitation would change in relationship to the water level at the sites. The surveys of the visitation and recreation use involved personal interviews of both camping and day use visitors along the Upper Truckee River, at Donner Lake, at Prosser Reservoir, at Stampede Reservoir, at Boca Reservoir, along the Lower Truckee River, and at Pyramid Lake. A questionnaire was used for the personal interviews. The surveys of the second-home owners and vacation-home renters involved mail-out questionnaires. The second-home owners and vacation-home renters were considered to be day use visitors at Donner Lake. There were a total of 506 respondents that participated in the surveys. Of the total respondents, 443 respondents participated in the surveys of the visitation and recreation use, and 63 respondents participated in the surveys of the second-home owners and vacation-home renters.

Estimation of the Expenditure Function

An expenditure function was estimated with data taken from the survey of the visitation. This expenditure function calculates the expenditures of camping and day use visitors per group per day by site. The sites, again, include Upper Truckee River, Donner Lake, Prosser Reservoir, Stampede Reservoir, Boca Reservoir, Lower Truckee River, and Pyramid Lake. This expenditure function was specified in a semi-logarithmic form and then estimated using a maximum-likelihood estimation technique. The expenditures per group per day by site were found to be dependent upon activity hours of respondents at the site and group size of respondents at the site.

Formulation of Model Equations

Model equations were formulated to calculate the annual number of camping and day use visitors at the reservoirs and the annual camping and day use visitor expenditures in the local economy relative to end of the month reservoir storage levels at Donner Lake, Prosser Reservoir, Stampede Reservoir, and Boca Reservoir. For each of these sites, the model equations calculate the annual number of camping and day use visitors by use of end of the month reservoir storage levels, visitation and end of the month reservoir storage level relationships, annual patterns of visitation, annual numbers of camping visitors, and ratios of day use visitors to camping visitors variables. The model equations calculate the annual camping and day use visitor expenditures by use of camping visitor expenditures and day use visitor expenditures variables. Data for these variables were taken from either the survey of the visitation, estimation of the expenditure function, or additional sources. Data taken from additional sources included the end of the month storage levels for each reservoir and number of camping visitors to the campgrounds at each reservoir.

End of the Month Reservoir Storage Levels

End of the month reservoir storage levels at Donner Lake, Prosser Reservoir, Stampede Reservoir, and Boca Reservoir serve as input data into the recreation model. The recreation model takes end of the month reservoir storage levels for April through October and the average reservoir storage level for November through March. End of the month reservoir storage levels range from a maximum of 9,660 acre-feet to 5,796 acre-feet at Donner Lake, from a maximum of 29,840 acre-feet to 0 acre-feet or drained at Prosser Reservoir, from a maximum of 226,500 acre-feet to 0 acre-feet or drained at Stampede Reservoir, and from a maximum of 40,780 acre-feet to 0 acre-feet or drained at Boca Reservoir. End of the month reservoir storage levels for 1993 were provided by the Bureau of Reclamation.

Visitation and End of the Month Reservoir Storage Level Relationships

Visitation and end of the month reservoir storage level relationships show the expected percentage of visitation at an end of the month reservoir storage level for Donner Lake, Prosser Reservoir, Stampede Reservoir, and Boca Reservoir. Visitation at Donner Lake and Boca Reservoir increases gradually as increases in storage levels occur. For Donner Lake, the visitation at a 6,000 acre-foot storage level is 83%. Visitation increases gradually to 100% as the storage levels reach the maximum of 9,660 acre-feet. For Boca Reservoir, the visitation for a drained reservoir is 5%. Visitation increases gradually from 5% to 100% as storage levels reach the maximum of 40,780 acre-feet. Visitation at Prosser Reservoir and Stampede Reservoir increases stepwise then gradually as increases in storage levels occur. For Prosser Reservoir, the visitation at a 6,000 acre-foot storage level is 15%. Visitation increases sharply to 70% as storage levels reach 9,000 acre-feet. Visitation increases gradually to 100% as storage levels reach the maximum or 29,840 acre-feet. For Stampede Reservoir, the visitation at a 46,000 acre-foot storage level is 20%. Visitation increases sharply to 60% as storage levels reach 69,000 acre-feet. Visitation increases not as sharply to 80% as storage levels reach 115,000 acre-feet. Visitation increases gradually to 100% as storage levels reach the maximum or 226,000 acre-feet. Definite visitation thresholds occur at different reservoir storage levels at Prosser and Stampede Reservoirs.

Annual Patterns of Visitation

Annual patterns of visitation show the distribution of visitation that occurs throughout the year at Donner Lake, Prosser Reservoir, Stampede Reservoir, and Boca Reservoir. The patterns of visitation for Donner Lake, Prosser Reservoir, and Stampede Reservoir are concave bell-shaped curves with the peak visitation in June, July, and August. For 100% visitation at Donner Lake, 5% occurs in April, 9% occurs in May, 17% occurs in June, 25% occurs in July, 24% occurs in August, 11% occurs in September, 4% occurs in October, and 5% occurs in November through March. For 100% visitation at Prosser Reservoir, 5% occurs in April, 10% occurs in May, 18% occurs in June, 24% occurs in July, 22% occurs in August, 12% occurs in September, 7% occurs in October, and 2% occurs in November through March. For 100% visitation at Stampede Reservoir, 5% occurs in April, 10% occurs in May, 22% occurs in June, 21% occurs in July, 25% occurs in August, 11% occurs in September, 5% occurs in October, and 1% occurs in November through March. The pattern of visitation for Boca Reservoir is a concave semi-circle-shaped curve with the peak visitation in August. For 100% visitation at Boca Reservoir, 6% occurs in April, 14% occurs in May, 18% occurs in June, 19% occurs in July, 20% occurs in August, 13% occurs in September, 7% occurs in October, and 3% occurs in November through March. Similar, for each of these sites, the visitation starts in April, reaches a peak in either July or August, and drops-off in September and October.

Annual Number of Camping and Day Use Visitors

The annual number of camping and day use visitors was calibrated to the annual number of camping for 1993. The California Department of Parks and Recreation and the Forest Service provided the annual number of camping visitors by campground at Donner Lake, Prosser Reservoir, Stampede Reservoir, and Boca Reservoir. For Donner Lake, Donner State Park had 195,099 camping visitors. For Prosser Reservoir, Lakeside, Prosser Family, Prosser Ranch, and Annie McCloud campgrounds had 37,816 camping visitors. For Stampede Reservoir, Davis Creek, Emigrant, and Logger campgrounds had 237,841 camping visitors. For Boca Reservoir, Boca, Boca Rest, Boca Spring, and Boyington Mill campgrounds had 65,813 camping visitors. The annual number of day use visitors were estimated with ratios of day use visitors to camping visitors at Donner Lake, Prosser Reservoir, Stampede Reservoir, and Boca Reservoir. Except for Donner Lake, the ratios were developed from data taken from the survey of the visitation. The Donner Lake ratio was developed from data provided by the California Department of Parks and Recreation. For Donner Lake, the ratio is .71 for 138,246 day use visitors. For Prosser Reservoir, the ratio is .38 for 14,384 day use visitors. For Stampede Reservoir, the ratio is .20 for 46,674 day use visitors. For Boca Reservoir, the ratio is 1.26 for 82,941 day use visitors. Donner Lake, Prosser Reservoir and Stampede Reservoir had fewer day use visitors than camping visitors, where as, Boca Reservoir had more day use visitors than camping visitors. The annual number of camping visitors and day use visitors deviate from the 1993 number under alternative end of the month reservoir storage levels.

Annual Camping and Day Use Visitor Expenditures

Camping and day use visitor expenditures for Donner Lake, Prosser Reservoir, Stampede Reservoir, and Boca Reservoir were taken from the estimation of the expenditure function. The expenditures were calculated as the group expenditure per day. For Donner Lake, the camping visitor group expenditure per day is \$36.97 and the day use visitor group expenditure is \$52.00. For Prosser Reservoir, the camping visitor group expenditure per day is \$27.90 and the day use visitor group expenditure is \$34.07. For Stampede Reservoir, the camping visitor group expenditure per day is \$39.61 and the day use visitor group expenditure is \$52.78. For Boca Reservoir, the camping visitor group expenditure per day is \$34.40 and the day use visitor group expenditure is \$48.85. For each of these sites, the day use visitor group expenditures per day were higher than the camping visitor group expenditures per day.

Input-Output Model Component

The input-output model component estimates the economic impacts. Tasks performed to develop this component include definition of the region, collection of the control total data, and derivation of the model tables. Model elements include output response coefficients, water transfer coefficients, and output requirements. A summary of each task and model element is given below.

Definition of the Region

The region was defined by an economic area, a population base, and several economic sectors. The hydrologic boundaries of the Truckee River Basin outline the region. Within the region, the economic area covers part of eastern California and part of western Nevada. Part of eastern California includes portions of Sierra, Nevada, Placer, El Dorado, and Alpine counties and the towns of Truckee, Tahoe City, and South Lake Tahoe. Part of western Nevada includes portions of Pershing, Washoe, Lyon, Carson City (an independent city), and Douglas counties and the cities of Reno and Sparks. The population base for the region is 316,381 persons. Of this amount, 16% is from the California counties and 84% is from the Nevada counties. There are several economic sectors in the economy in the region. These sectors include livestock production, dairy production, alfalfa hay production, other hay production, barley production, agricultural services, gold mining, other mining, construction, manufacturing, transportation and communications, utilities, trade, eating, drinking, and lodging, finance, insurance, and real estate, services, hotels, gaming, and recreation, health, local government, and households.

Collection of the Control Total Data

Control total data was collected for the region. There is a control total for output, employment, income, population, housing, agriculture water use, commercial water use, and residential water use. A definition, a source, and values by economic sector for the region by state are given for each control total. The values are estimated either by using specific information, coefficients, or county level data adjusted to the region by population. For the region, output is \$17,857,271,279. Employment is 188,121 jobs. Income is \$6,720,549,054. Population is 307,874 persons. Housing is 122,239 dwellings. Agriculture water use is 73,696 acre-feet. Commercial water use is 12,432 acre-feet. Residential water use is 72,453 acre-feet.

Derivation of the Model Tables

Input-output tables were derived from the transactions matrix for the region. A transactions matrix is a double entry accounting system. All transactions that an economic sector has within the economy are accounted for in the transactions matrix. There is an individual row and column for each sector in the matrix. Row entries represent output and include sales, other final demand, and exports by a sector. Other final demand are capital formation, inventory accumulation, state government purchases, and federal government purchases. Column entries, on the other hand, represent input and include purchases, other final payments, and imports by a sector. Other final payments are depreciation, expenditures to state government, and expenditures to federal government. The accounting identity of the matrix requires that for any sector the row total must equal the column total. Input-output model tables were found by performing a sequence of calculations involving matrix algebra. The input-output tables include direct requirements, final demand requirements, output requirements, employment requirements, income requirements, and multipliers.

Output Response Coefficients

Output response coefficients measure the employment, income, population, housing, agriculture water use, commercial water use and residential water use response to output from an economic sector. Key sectors include livestock production, manufacturing, trade, eating, drinking, and lodging, and hotels, gaming, and recreation. The response to a \$1 million output in livestock production is 19 jobs, \$161,786 in income, 38 people, 15 dwellings, 16,433 acre-feet of agriculture water use, .90 acre-feet of commercial water use, and 9 acre-feet of residential water use. The response to a \$1 million output in manufacturing is 8 jobs, \$263,690 in income, 14 people, 5 dwellings, .33 acre-feet of commercial water use, and 3 acre-feet of residential water use. The response to a \$1 million output in trade is 25 jobs, \$486,901 in income, 41 people, 16 dwellings, .93 acre-feet of commercial water use, and 10 acre-feet of residential water use. The response to a \$1 million output in eating, drinking, and lodging is 19 jobs, \$333,658 in income, 34 people, 13 dwellings, 2 acre-feet of commercial water use, and 8 acre-feet of residential water use. The response to a \$1 million output in hotels, gaming, and recreation is 19 jobs, \$322,800 of income, 30 people, 12 dwellings, 3.37 acre-feet of commercial water use, and 7 acre-feet of residential water use. These output response coefficients are taken from the collection of the control total data.

Water Transfer Coefficients

Water transfer coefficients determine the portions of agriculture water use among economic sectors for an agriculture water transfer and the portions of commercial water use among sectors for a commercial water transfer. Key sectors include livestock production for an agriculture water transfer and manufacturing, and hotels, gaming, and recreation for a commercial water transfer. The water transfer coefficient is 1 or 100% for livestock production. This coefficient is based on an agriculture water use of 54,876 acre-feet for livestock production. For a 1,000 acre-foot agriculture water transfer, the entire 1,000 acre-feet of agriculture water use is from livestock production. Water transfer coefficients are .09 or 9% for manufacturing, and .91 or 91% for hotels, gaming, and recreation. These coefficients are based on a commercial water use of 452 acre-feet for manufacturing and commercial water use of 4,589 acre-feet for hotels, gaming, and recreation. For a 1,000 acre-foot commercial water transfer, the 1,000 acre-feet of commercial water use is to manufacturing and hotels, gaming, and recreation. The commercial water use for manufacturing is 90 acre-feet. The commercial water use for hotels, gaming, and recreation is 910 acre-feet. These water transfer coefficients are also taken from the collection of the control total data.

Output Requirements

Output requirements measure the total economic impact from a change in output. The output requirements table is taken from the derivation of the model tables. Output requirements show the dollar amount of change in economic activity of the row sector from a dollar change in output of the column sector. The column totals are the output total requirements that show the total dollar amount of change in economic activity of all row sectors from a dollar change in output of the column sector. Key sectors include livestock production, manufacturing, trade, eating, drinking, and lodging, and hotels, gaming, and recreation. A \$1 million output change in livestock production leads to a \$1.9 million change economic activity. A \$1 million output change in manufacturing leads to a \$1.7 million change economic activity. A \$1 million output change in trade leads to a \$2.2 million change economic activity. A \$1 million output change in eating, drinking, and lodging leads to a \$2 million change economic activity. A \$1 million output change in hotels, gaming, and recreation leads to a \$1.9 million change economic activity. The output total requirements are the same as output multipliers.

6.2. Explanation of the Model Applications

The regional economic model has two applications. The first application is estimation of economic impacts for alternative reservoir storage levels at Donner Lake, and at, Prosser, Stampede, and Boca Reservoirs. The second application is estimation of economic impacts for reallocations of water.

Estimation of the Economic Impacts for Alternative Reservoir Storage Levels

Estimation of the economic impacts for alternative reservoir storage levels requires an understanding of three separate actions. These actions include measurement of an economic impact, operation of the computer program, presentation of the results. A summary of each action is given below.

Measurement of an Economic Impact

The economic impact for alternative reservoir storage levels at Donner Lake, and at, Prosser, Stampede, and Boca Reservoirs is measured in the following manner. An economic impact occurs because of recreation activities at the reservoirs. At each alternative reservoir storage level there is a different level of recreation in terms of visitation to the reservoirs and expenditures in the local economy. Visitation to the reservoirs is by camping and day use visitors. Expenditures in the economy are on items necessary for recreation at the reservoirs. Items such as gas, groceries, supplies, meals at restaurants, hotel rooms, and vacation-home rent. Camping and day use visitors purchase these items from businesses and cause a direct effect to occur on the economic activity in the region. In addition to this direct effect, indirect and induced effects also occur. Given that businesses in the region sell items for recreation to camping and day use visitors, these businesses also purchase products and services from other businesses in the region. Because of these purchases being made, there is then an indirect effect on other businesses and on economic activity in the region. The induced effect on economic activity in the region is household spending by employees of these affected businesses. At each alternative reservoir storage level there is a different amount of household spending by employees. Together the direct, indirect, and induced effects on economic activity make-up the total effect or total economic impact on the region for alternative reservoir storage levels.

Operation of the Computer Program

The computer program starts with input data. The input data is the alternative end of the month reservoir storage levels at Donner Lake, and at, Prosser, Stampede, and Boca Reservoirs. The program takes the alternative reservoir storage levels and performs the first process. This process calculates the number of camping and day use visitors and

the annual camping and day use visitor expenditures with the recreation model. Output from this process is the direct economic impact by economic sector. From this, the program takes the direct economic impact by economic sector and performs the second process. This process multiplies the direct economic impact by economic sector by the output requirements of the input-output model. Output from this process is the total economic impact by economic sector. Finally, the program takes the total economic impact by economic sector and performs the third process. This process multiplies the total economic impact by economic sector by the output response coefficients of the input-output model. Output from this process is the response economic impact by economic sector. Having generated the direct economic impact, total economic impact, and response economic impact the program stops.

Presentation of the Results

Given 1993 end of the month reservoir storage levels for Donner Lake, Prosser Reservoir, Stampede Reservoir, and Boca Reservoir, the results are presented in the following sequence. Average end of the month reservoir storage is 6,742 acre-feet for Donner Lake, 15,655 acre-feet for Prosser Reservoir, 146,104 acre-feet for Stampede Reservoir, and, 28,171 acre-feet for Boca Reservoir. Relative to the end of the month reservoir storage levels, the camping and day use visitors are 333,345 visitors for Donner Lake, 52,200 visitors for Prosser Reservoir, 284,515 visitors for Stampede Reservoir, and 148,754 visitors for Boca Reservoir. The direct economic impact from the camping and day use visitors is recreation expenditures of \$6,972,260. This direct economic impact generates additional economic activity for a total economic impact of \$9,882,066. The response economic impact is 83 jobs for employment, \$1,502,805 of income, 141 persons for population, 56 dwellings for housing, 6 acre-feet for commercial water use, and 33 acre-feet for residential water use. The recreation expenditure multiplier is 1.42. An additional dollar of recreation expenditure generates an additional forty-two cents of economic activity.

Estimation of the Economic Impacts for Reallocations of Water

Estimation of the economic impacts for reallocations of water also requires an understanding of three separate actions. These actions include, again, measurement of an economic impact, operation of the computer program, presentation of the results. A summary of each action is given below.

Measurement of an Economic Impact

The economic impact for a reallocation of water from agriculture water use to commercial water use is measured in the following manner. An economic impact occurs since water is a resource requirement for agriculture production and commercial activity. A reallocation of water transfers an amount of water from agriculture water use to commercial water use. The direct effect on economic activity in the region is a decrease in agriculture production from farms and ranches, and an increase in commercial activity from businesses. The indirect effect on economic activity in the region is also a decrease in business activity from those businesses that sell products and services to farms and ranches for agriculture production, and also an increase in business activity of the businesses that sell products and services to businesses that have an increase in commercial activity. The induced effect on economic activity in the region is a decrease in household spending by employees on farms and ranches, and an increase in household spending by employees in commercial businesses. Together the direct, indirect, and induced effects on economic activity make-up the total effect or total economic impact on the region for a reallocation of water from agriculture water use to commercial water use.

Operation of the Computer Program

The computer program starts with input data. The input data is either an agriculture water transfer amount or a commercial water transfer amount. From this, the program takes the water transfer amount and performs the first process. This process multiplies the water transfer amount by water transfer coefficients of the input-output model. Output from this process is the water transfer amount by economic sector for either an agriculture water transfer or a commercial water transfer. From this, the program then takes the water transfer amount by economic sector and performs the second process. This process divides the water transfer amount by economic sector by the output response coefficients for either agriculture water use or commercial water use of the input-output model. Output from this process is the direct economic impact by economic sector for either an agriculture water transfer or a commercial water transfer. From this, again the program takes the direct economic impact by economic sector and performs the third process. This process multiplies the direct economic impact by economic sector by the output requirements of the input-output model. Output from this process is the total economic impact by economic sector for either a agriculture water

transfer or commercial water transfer. Finally, the program takes the total economic impact by economic sector and performs the fourth process. This process multiplies the total economic impact by economic sector by output response coefficients of the input-output model. Output from this process is the response economic impact by economic sector for either a agriculture water transfer or commercial water transfer. Having generated the direct economic impact, total economic impact, and response economic impact the program stops.

Presentation of the Results

Given a 40,000 acre-foot reallocation of water from agriculture water use to commercial water use, the results are presented in the following sequence. For the agriculture water transfer, the water transfer amount is 34,909 acre-feet. The direct economic impact for the transfer amount is output of \$2,124,370. The total economic impact is output of \$3,973,146. The response economic impact is 60 jobs for employment, \$719,122 of income, 115 persons for population, 45 dwellings for housing, 39,977 acre-feet for agriculture water use, 3 acre-feet for commercial water use, and 20 acre-feet for residential water use. Combined water use is 40,000 acre-feet. The water transfer multiplier is 1.15. To compensate for commercial and residential water use, each additional acre-foot for a agriculture water transfer requires an additional .15 acre-feet. For the commercial water transfer, the water transfer amount is 8,853 acre-feet. The direct economic impact for the transfer amount is output of \$4,786,743,051. The total economic impact is output of \$8,734,949,797. The response economic impact is 101,022 jobs for employment, \$2,035,933,140 of income, 163,502 persons for population, 65,026 dwellings for housing, 0 acre-feet for agriculture water use, 10,980 acre-feet for commercial water use, and 29,020 acre-feet for residential water use. Combined water use is 40,000 acre-feet. The water transfer multiplier is 4.52. To compensate for residential water use, each additional acre-foot for a commercial water transfer requires an additional 3.52 acre-feet.

6.3. Presentation of the Model Improvements

Model improvements are made to the recreation model component and model application for estimation of the economic impacts for alternative reservoir storage levels. These improvements required supplement work.

Recreation Model Component Improvement

Supplement work for recreation model component improvement is a repeat of the recreation model component tasks. Tasks include survey of the visitation, estimation of the expenditure function, survey of the second-home owners, survey of the vacation-home renters, estimation of the expenditure function, and formulation of the model equations. The first estimation of the expenditure function is with 1993 and 1994 survey of visitation data. The second estimation is with 1993 and 1994 survey of visitation data plus 1995 survey of second-home owners and survey of vacation-home renters data.

Model Application Improvement

Supplement work for model application improvement is a repeat of the estimation of the economic impacts for alternative reservoir storage levels.

**TRUCKEE RIVER BASIN
REGIONAL ECONOMIC IMPACT MODEL**

PART 2 OF 2



**Truckee River Basin
Regional Economic Impact Model**

Report Prepared by

**Thomas R. MacDiarmid
Karl A. McArthur
Thomas R. Harris
Robert R. Fletcher
Kambiz Raffiee
Shawn W. Stoddard
and
Rangesan Narayanan**

Thomas R. MacDiarmid is a Research Associate in the Department of Agricultural Economics at the University of Nevada, Reno.

Karl A. McArthur is a Research Associate in the Department of Agricultural Economics at the University of Nevada, Reno.

Thomas R. Harris is a Professor in the Department of Agricultural Economics and Director of the University Center for Economic Development at the University of Nevada, Reno.

Robert R. Fletcher is a Professor in the Department of Agricultural Economics at the University of Wyoming.

Kambiz Raffiee is an Associate Professor in the Department of Economics at the University of Nevada, Reno.

Shawn W. Stoddard is a Research Associate in the Department of Agricultural Economics at the University of Nevada, Reno.

Rangesan Narayanan is a Professor and Chairman in the Department of Agricultural Economics at the University of Nevada, Reno.

July 1995

**UNIVERSITY
OF NEVADA
RENO**

The University of Nevada, Reno is an Equal Opportunity/Affirmative Action employer and does not discriminate on the basis of race, color, religion, sex, age, creed, national origin, veteran status, physical or mental disability, and in accordance with university policy, sexual orientation, in any program or activity it operates. The University of Nevada employs only United States citizens and aliens lawfully authorized to work in the United States.

This publication, *Truckee River Regional Economic Impact Model*, was published by the University Center for Economic Development in the Department of Agricultural Economics at the University of Nevada, Reno. Funds for this publication were provided by the United States Department of the Interior, Bureau of Reclamation. This publication's statements, conclusions, recommendations, and/or data represent solely the findings and views of the authors and do not necessarily represent the views of the United States Department of the Interior, the Bureau of Reclamation, University of Nevada, Reno, or any reference sources used or quoted by this study. Reference to research projects, programs, books, magazines, or newspaper articles does not imply an endorsement or recommendation by the authors unless otherwise stated. Correspondence regarding this document should be sent to:

Rangesan Narayanan
Chairman and Professor
Department of Agricultural Economics
Mail Stop 204
University of Nevada, Reno
Reno, Nevada 89557-0105
(702) 784-6701

and

Thomas R. Harris
Director and Professor
University Center for Economic Development
Department of Agricultural Economics
Mail Stop 204
University of Nevada, Reno
Reno, Nevada 89557-0105
(702) 784-1681

UCED
University of Nevada, Reno
Nevada Cooperative Extension
Department of Agricultural Economics

Supplement

7. Recreation Model Component Improvement

Recreation model component improvement includes survey of the visitation, estimation of the expenditure function, survey of the second-home owners, survey of the vacation-home renters, estimation of the expenditure function, and formulation of the model equations. There are two sections on estimation of the expenditure function. The first section is estimation with 1993 and 1994 survey of visitation data. The second section is estimation with 1993 and 1994 survey of visitation data plus 1995 survey of second-home owners and survey of vacation-home renters data.

7.1. Survey of the Visitation

A visitation survey of the Truckee River Basin was done from May 28th through September 3rd, 1994. Specific recreation sites visited included Donner Lake, Prosser Reservoir, Stampede Reservoir, Boca Reservoir, and Pyramid Lake. The purpose of the survey was to first obtain an overall picture of the visitation and recreation activities occurring at the sites, second, quantify the amount of expenditures that visitors at the sites make to the local economy, and third, identify how the visitation would change in relation to the level of water at the sites. To achieve this purpose, information was gathered from visitors at each site through an interview process using a questionnaire. During the interview process, observations were also made at each site. Once the interview process was completed, all the data was then compiled and analyzed to develop a set of descriptive statistics. The interview questionnaire, a list of observations, and the descriptive statistics of the data are presented below.

Interview Questionnaire

On-site interviews were done using a questionnaire. Through this questionnaire, visitors were asked to provide general information and answer general, site specific, and demographic questions. General information includes gender of respondent, type of visitor and length of stay, group size, and group make-up. General questions identify visitation in terms of number of visits to the reservoirs and lakes and in which months, and the importance of decision factors to visit any reservoir or lake. Site specific questions were asked on the site where the visitor was at the time of the interview. These questions identify the quality of site characteristics, the number of hours spent participating in recreation activities at the site, local expenditures made to visit the site, whether or not respondents would continue to visit the site if the water level were to change, which other site would be chosen in the event that the water level did change to the point they would no longer continue to visit the site, and the willingness to pay by the visitor to keep the water level at the interview site suitable for recreation. Demographic questions identify age, marital status, number of adults and children in household, education, and household income of the visitor. These demographic questions, however, due to their sensitivity, were made optional. The questions and interview schedule are given below.

General Information

Gender of Respondent:

Male _____
Female _____

Type of Visitor and Length of Stay:

Day User _____ Length of Stay _____ Hours
Camper _____ Length of Stay _____ Days

Group Size:

Number of Adults _____
Number of Children _____

Group Make-up:

Family _____
Friends _____

Number of Vehicles _____ (include cars, pickups, campers, & RVs)
Number of Boats _____
Number of Jet Ski's _____
Number of Camp Trailers _____

City: _____
County: _____
State: _____
Zip Code: _____

General Questions

1. (a) How many times in a year do you typically visit the following reservoirs or lakes?

Donner Lake _____
 Prosser Reservoir _____
 Stampede Reservoir _____
 Boca Reservoir _____
 Pyramid Lake _____

(b) Which months of the year do you visit these reservoirs or lakes?

April _____
 May _____
 June _____
 July _____
 August _____
 September _____
 October _____
 Other _____

2. How important to you are the following factors in visiting a reservoir or lake? Please rate the factors as very important, somewhat important, somewhat unimportant, not important at all, or no opinion. We will assign 1 point for "very important", 2 for "somewhat important", 3 for "somewhat unimportant", 4 for "not important at all", or 5 for "no opinion".

Factors	1	2	3	4	5
	Very	Somewhat	Somewhat	Not	No
	Important	Important	Unimportant	Important	Opinion
				at All	

Activity Opportunity					
Access					
Crowd Level					
Facilities					
Water-Level					
Area Setting					

Site Specific Questions

1. How do you rate the following characteristics at this reservoir or lake? Please rate the characteristics as very good, good, satisfactory, poor, or very poor. We will assign 1 point for "very good", 2 for "good", 3 for "satisfactory", 4 for "poor", or 5 for "very poor".

Characteristics	1 Very Good	2 Good	3 Satisfactory	4 Poor	5 Very Poor
Activity Opportunity					
Access					
Crowd Level					
Facilities					
Water-Level					
Area Setting					

2. (a) What is the approximate time you will spend today on each of the following activities? Please also list any additional activities.

Activities	Hours per Day											
Fishing from Shore	1	2	3	4	5	6	7	8	9	10	11	12
Fishing from Boat	1	2	3	4	5	6	7	8	9	10	11	12
Water Skiing	1	2	3	4	5	6	7	8	9	10	11	12
Pleasure Boating	1	2	3	4	5	6	7	8	9	10	11	12
Jet Skiing	1	2	3	4	5	6	7	8	9	10	11	12
Swimming	1	2	3	4	5	6	7	8	9	10	11	12
Picnicing	1	2	3	4	5	6	7	8	9	10	11	12
Hiking	1	2	3	4	5	6	7	8	9	10	11	12
Biking	1	2	3	4	5	6	7	8	9	10	11	12
	1	2	3	4	5	6	7	8	9	10	11	12
	1	2	3	4	5	6	7	8	9	10	11	12

- (b) If the water-level changed, would your activities change?

Yes _____
 No _____

3. (a) How many times did you visit this reservoir or lake last month?

(b) Which of the following activities did you participate in?

Activities

Fishing from Shore	
Fishing from Boat	
Water Skiing	
Pleasure Boating	
Jet Skiing	
Swimming	
Picnicing	
Hiking	
Biking	

4. How much did you spend on the following items to visit this reservoir or lake this trip? Indicate the percentage of the total spent in Truckee, Reno/Sparks or Other Area.

Items	Total \$	Truckee %	Reno/Sparks %	Other-Area %
Camping Fees				
License Fees				
Hotel and Motel				
Restaurant				
Groceries and Supplies				
Gas				
Shopping				
Rental				
Total				

Today the water-levels at these reservoirs or lakes are:

Donner Lake	_____ acre-feet	or	_____ % of full storage.
Prosser Reservoir	_____ acre-feet	or	_____ % of full storage.
Stampede Reservoir	_____ acre-feet	or	_____ % of full storage.
Boca Reservoir	_____ acre-feet	or	_____ % of full storage.

5. (a) If this water-level is maintained at the level you see today, how many times would you visit this reservoir or lake during this month including this trip?

- (b) If the water-level at this reservoir or lake were higher than the level you see today, would you change the number of visits during this month?

Yes _____
No _____

- (c) If the water-level at this reservoir or lake were lower than the level you see today, would you change the number of visits during this month?

Yes _____
No _____

- (d) If (b) and or (c) is yes, on the chart, indicate the number of times you would visit at the following water-levels during this month:

Donner Lake

Storage as a % of Full Capacity	Number of Visits per Month	Acre-Feet of Storage	Acres of Surface Area	Elevation Lowering in Feet	Boat Ramp Status
100%		9,670	748	0	usable
90%		8,703	707	1	usable
80%		7,736	672	2	not usable
70%		6,769	633	3	not usable
60%		5,802	587	4	not usable

Prosser Reservoir

Storage as a % of Full Capacity	Number of Visits per Month	Acre-Feet of Storage	Acres of Surface Area	Elevation Lowering in Feet	Boat Ramp Status
100%		29,840	748	0	usable
90%		26,856	707	8	usable
80%		23,872	672	16	usable
70%		20,888	633	24	usable
60%		17,904	587	32	usable
50%		14,920	533	40	usable
40%		11,936	468	48	usable
30%		8,952	389	56	not usable
20%		5,968	291	64	not usable
10%		2,984	166	72	not usable
0%		0	0	80	not usable

Stampede Reservoir

Storage as a % of Full Capacity	Number of Visits per Month	Acre-Feet of Storage	Acres of Surface Area	Elevation Lowering in Feet	Boat Ramp Status
100%		226,500	3,440	0	usable
90%		203,850	3,185	15	usable
80%		181,200	3,020	30	usable
70%		158,550	2,831	45	usable
60%		135,900	2,613	60	usable
50%		113,250	2,359	75	usable
40%		90,600	2,059	90	usable
30%		67,950	1,699	105	not usable
20%		45,300	1,258	120	not usable
10%		22,650	708	135	not usable
0%		0	0	151	not usable

Boca Reservoir

Storage as a % of Full Capacity	Number of Visits per Month	Acre-Feet of Storage	Acres of Surface Area	Elevation Lowering in Feet	Boat Ramp Status
100%		40,870	977	0	usable
90%		36,783	920	8	usable
80%		32,696	896	16	usable
70%		28,609	867	24	not usable
60%		24,522	831	32	not usable
50%		20,435	786	40	not usable
40%		16,348	727	48	not usable
30%		12,261	645	56	not usable
20%		8,174	527	64	not usable
10%		4,087	341	72	not usable
0%		0	0	82	not usable

6. If you no longer choose to visit this reservoir or lake because of water-level, which of the following reservoirs or lakes would you then choose to visit assuming the water-levels at these other reservoirs and lakes remained at today's level?

Donner Lake _____
 Prosser Reservoir _____
 Stampede Reservoir _____
 Boca Reservoir _____
 Pyramid Lake _____
 Other _____

7. How much would you be willing to pay per year not to have the water-level at this reservoir or lake fall below today's level?

\$0 _____
 \$1 - 5 _____
 \$6 - 10 _____
 \$11 -25 _____
 \$26 - 50 _____
 \$51 - 100 _____
 Over \$100 _____

Demographic Questions

1. Indicate your age:

Under 16 years _____
16 - 20 _____
21 - 30 _____
31 - 40 _____
41 - 50 _____
51 - 60 _____
61 - 70 _____
Over 70 _____

2. What is your marital status:

Single _____
Married _____

3. How many adults are in your household:

Male _____
Female _____

4. How many children are in your household:

Male _____
Female _____

5. Indicate your education level:

Elementary School _____
High School _____
Technical School _____
2 Years of College _____
4 Years of College _____
Graduate School _____

6. Indicate your annual household income level:

- Below \$10,000 _____
- \$10,000 - \$25,000 _____
- \$26,000 - \$50,000 _____
- \$51,000 - \$75,000 _____
- \$76,000 - \$100,000 _____
- \$100,000 - \$150,000 _____
- Over \$150,000 _____

Interview Schedule

The interview schedule is given below. Trips were made to each site on a week day, a weekend day, and a holiday weekend day. Trips to Boca, Stampede, and Prosser Reservoirs were combined because of visitation and water-levels.

May (1 day)

May 28, 1994	Saturday	Boca, Stampede, and Prosser
--------------	----------	-----------------------------

June (5 days)

June 10, 1994	Friday	Pyramid Lake
June 11, 1994	Saturday	Boca, Stampede, and Prosser Reservoirs
June 17, 1994	Friday	Boca, Stampede, and Prosser Reservoirs
June 24, 1994	Friday	Donner Lake
June 25, 1994	Saturday	Boca, Stampede, and Prosser Reservoirs

July (6 days)

July 2, 1994	Saturday	Boca, Stampede, and Prosser Reservoirs Donner Lake
July 8, 1994	Friday	Boca, Stampede, and Prosser Reservoirs
July 9, 1994	Saturday	Pyramid Lake
July 16, 1994	Saturday	Boca, Stampede, and Prosser Reservoirs
July 22, 1994	Friday	Boca, Stampede, and Prosser Reservoirs
July 23, 1994	Saturday	Donner Lake

August (4 days)

August 5, 1994	Friday	Pyramid Lake
August 6, 1994	Saturday	Boca, Stampede, and Prosser Reservoirs
August 12, 1994	Friday	Donner Lake
August 20, 1994	Saturday	Boca, Stampede, and Prosser Reservoirs

September (1 day)

September 3, 1994	Saturday	Boca, Stampede, and Prosser Reservoirs Donner Lake
-------------------	----------	---

The total number of visitors that participated in an interview was 281. There were 83 interviews at Donner Lake, 32 interviews at Prosser Reservoir, 64 interviews at Stampede Reservoir, 31 interviews at Boca Reservoir, and 71 interviews at Pyramid Lake.

List of Observations

Observations were made at each site during the interview process. Key observations are listed below.

1. Approximately 90,000 acre-feet of water was released from Stampede Reservoir prior to the summer season of June, July, and August. This water increased river flows in the Truckee River so that the cui ui fish could spawn upstream from Pyramid Lake. On account of this, storage in Stampede Reservoir went from 170,000 acre-feet in March to 80,000 acre-feet in May.
2. At Donner Lake, storage was at the maximum of 9,700 acre-feet in June. In July, however, water was released from storage and the lake water-level dropped approximately three feet to a storage of 6,800 acre-feet. Another foot could have been released but the Town of Truckee forced an exchange agreement to have water released from Boca Reservoir instead of Donner Lake. Donner Lake was then held at 6,800 acre-feet of storage through August.
3. At Prosser Reservoir, storage went from 9,700 acre-feet in June to 9,600 acre-feet in August. This storage is approximately 32% of full storage. Full storage at Prosser Reservoir is 29,840 acre-feet.
4. At Stampede Reservoir, storage went from 80,000 acre-feet or 35% of full storage in June to 69,000 acre-feet or 30% of full storage in August. Full storage at Stampede Reservoir is 226,500 acre-feet.
5. At Boca Reservoir, storage went from 28,700 acre-feet or 70% of full storage to 7,300 acre-feet or 18% of full storage in June. Through July and August, Boca Reservoir went from the 7,300 acre-feet to 4,300 acre-feet or 10% of full storage in August. Full storage for Boca Reservoir is 40,870 acre-feet.
6. Visitation to Donner Lake and Pyramid Lake peaked in August whereas visitation to Prosser, Stampede, and Boca Reservoirs peaked in July. The reason for the shorten summer season at Prosser, Stampede, and Boca Reservoirs was because of low water-levels, drought conditions, and the threat of wild fires.
7. The highest number of camping visitors were at Donner Lake followed by Stampede Reservoir, Pyramid Lake, and Prosser Reservoir. The highest number of day use visitors were also at Donner Lake followed by Pyramid Lake and Boca Reservoir.

8. The proportionate split of camping visitors to day use visitors was approximately 50% camping visitors to 50% day use visitors at Donner Lake, 100% camping visitors at Prosser Reservoir, 90% camping visitors to 10% day use visitors at Stampede Reservoir, 20% camping visitors to 80% day use visitors at Boca Reservoir, and 10% camping visitors to 90% day use visitors at Pyramid Lake.
9. At improved campgrounds, the occupancy throughout the summer season was 100% at Donner Lake, 40% at Prosser Reservoir, 60% at Stampede Reservoir, and 10% at Boca Reservoir.
10. Boat ramps were out of the water throughout the summer season at Prosser, Stampede, and Boca Reservoirs. At Prosser and Stampede Reservoirs, however, the boat ramps were still in use because of natural hard pack beyond the paved portions of the boat ramps. At Boca Reservoir, natural boat ramps were in use.
11. Water related activities at Donner Lake and Pyramid Lake were swimming, boating, water skiing, and jet skiing. Water related activities at Prosser Reservoir were fishing from shore, and fishing from a boat. Water related activities at Stampede Reservoir were swimming, fishing from shore, boating, fishing from a boat, water skiing, and jet skiing. Water related activities at Boca Reservoir were swimming, fishing from shore, and jet skiing.

Descriptive Statistics

The descriptive statistics of the data are presented below with an explanation of their interpretation. The descriptive statistics include number of respondents, site visitation of respondents, activities of respondents, annual visitation of respondents, annual visitation of respondents per site, number of visits by respondents per site, local and non-local respondents per site, group make-up of respondents per site, camping and day use respondents per site, ranking of reasons to visit by respondents per site, expenditures by respondents per site, expenditures by camping respondents per site, expenditures by day use respondents per site, activity hours per day by respondents per site, activity hours per day by camping respondents per site, activity hours per day by day use respondents per site, indicated number of visits by respondents at alternative water levels per site, site substitution of respondents per site, willingness of respondents to pay to maintain water level per site, age brackets of respondents, education levels of respondents, and household income levels of respondents.

Number of Respondents

The number of respondents successfully interviewed were 281 visitors.

The breakdown of the number of respondents for each site is provided in Table 7.1-1. There were 83 respondents at Donner Lake, 32 respondents at Prosser Reservoir, 64 respondents at Stampede Reservoir, 31 respondents at Boca Reservoir, and 71 respondents at Pyramid Lake.

Table 7.1-1. Number of Respondents.

	Study Area	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
Number of Respondents	281	83	32	64	31	71
Percentage of Respondents		29.54%	11.39%	22.78%	11.03%	25.27%

Site Visitation of Respondents

The overall greatest site visitation of respondents was at Donner Lake.

The site visitation of respondents is presented in Table 7.1-2. Of the 281 respondents, 46% indicated that they visited Donner Lake an average of 5 visits during the year, 16% indicated that they visited Prosser Reservoir an average of 6 visits during the year, 37% indicated that they visited Stampede Reservoir an average of 4 visits during the year, 26% indicated that they visited Boca Reservoir an average of 6 visits during the year, 36% indicated that they visited Pyramid Lake an average of 10 visits during the year. The highest percentage of respondents indicated that they visited Donner Lake and Stampede Reservoir. The highest average number of visits by respondents are indicated for Pyramid Lake and Boca Reservoir. These numbers are influenced by local day use visitors choosing to visit the sites more frequently. In contrast, the lowest number of visits by respondents are for Donner Lake and Stampede Reservoir. These numbers are influenced by non-local camping visitors choosing to visit the sites less frequently.

Table 7.1-2. Site Visitation of Respondents.

	Study Area	Donner Lake	Proser Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
Number of Respondents	281	130	46	104	73	100
Percentage of Respondents		46.26%	16.37%	37.01%	25.98%	35.59%
Number of Visits by Respondents		685	256	432	445	1037
Average Number of Visits by Respondents		5.27	5.57	4.15	6.10	10.37

Activities of Respondents

Most of the respondents participated in picnicking, hiking, swimming, and fishing activities.

Activities of respondents are shown in Table 7.1-3. The activities include picnicking, camping, fishing, swimming, boating, fishing from a boat, water skiing, jet skiing, rafting, kayaking, biking, hiking, and other activities. Of the 281 respondents, 56% indicated that they were picnicking, 27% indicated that they were fishing, 38% indicated that they were swimming, 9% indicated that they were boating, 18% indicated that they were fishing from a boat, 5% indicated that they were water skiing, 4% indicated that they were jet skiing, 18% indicated that they were biking, 39% indicated that they were hiking, and 15% indicated that they were doing other activities. The other activities mentioned by the respondents include relaxing, getting away from it all, reading, and drinking beer.

Table 7.1-3. Activities of Respondents.

	Study Area
Number of Respondents Picnicking	157
Number of Respondents Camping	N.A.
Number of Respondents Fishing	77
Number of Respondents Swimming	106
Number of Respondents Boating	25
Number of Respondents Fishing from Boat	50
Number of Respondents Water Skiing	15
Number of Respondents Jet Skiing	11
Number of Respondents Rafting	N.A.
Number of Respondents Kayaking	N.A.
Number of Respondents Biking	50
Number of Respondents Hiking	109
Number of Respondents Other	42
Percentage of Respondents Picnicking	55.87%
Percentage of Respondents Camping	N.A.
Percentage of Respondents Fishing	27.40%
Percentage of Respondents Swimming	37.72%
Percentage of Respondents Boating	8.90%
Percentage of Respondents Fishing from Boat	17.79%
Percentage of Respondents Water Skiing	5.34%
Percentage of Respondents Jet Skiing	3.91%
Percentage of Respondents Rafting	N.A.
Percentage of Respondents Kayaking	N.A.
Percentage of Respondents Biking	17.79%
Percentage of Respondents Hiking	38.79%
Percentage of Respondents Other	14.95%

Annual Visitation of Respondents

Annual visitation of respondents to the study area is the highest in the summer months of June, July, and August.

Annual visitation of respondents is presented in Table 7.1-4. Of the 281 respondents, 18% indicated that they visit the study area in April, 40% indicated that they visit the study area in May, 79% indicated that they visit the study area in June, 88% indicated that they visit the study area in July, 79% indicated that they visit the study area in August, 43% indicated that they visit the study area in September, 22% indicated that they visit the study area in October, and 11% indicated that they visit the study area in Other months. Other months include January, February, March, November, and December.

Table 7.1-4. Annual Visitation of Respondents.

	Study Area
Number of Respondents that Visit during April	50
Number of Respondents that Visit during May	111
Number of Respondents that Visit during June	221
Number of Respondents that Visit during July	248
Number of Respondents that Visit during August	223
Number of Respondents that Visit during September	120
Number of Respondents that Visit during October	61
Number of Respondents that Visit during Other	30
Percentage of Visitation during April	17.79%
Percentage of Visitation during May	39.50%
Percentage of Visitation during June	78.65%
Percentage of Visitation during July	88.26%
Percentage of Visitation during August	79.36%
Percentage of Visitation during September	42.70%
Percentage of Visitation during October	21.71%
Percentage of Visitation during Other	10.68%

Annual Visitation of Respondents per Site

The annual visitation of respondents per site follow a similar pattern. This pattern shows that during the year visitation at a site will begin in April and steadily increase throughout May, June, July, and August and then decrease sharply during September and October to end at very low visitation during the Other months.

The annual visitation of respondents per site are shown in Table 7.1-5. The pattern of annual visitation for a site is based on the number of respondents that indicated that they visit the study area and visit the site in a given month. To clarify this, for Boca Reservoir, 8 out of the 50 respondents indicated that they visit in April, 22 out of the 111 respondents indicated that they visit in May, 30 out of the 221 indicated that they visit in June, 28 out of the 248 respondents indicated that they visit in July, 26 out of the 223 respondents indicated that they visit in August, 17 out of the 120 indicated that they visit in September, 9 out of the 61 respondents indicated that they visit in October, and 5 out of the 30 respondents indicated that they visit in Other months.

These numbers are then divided by their summation and presented as a percentage of visitation during the given month. Of the total annual visitation at Boca Reservoir, 6% is during April, 15% is during May, 21% is during June, 19% is during July, 18% is during August, 12% is during September, 6% is during October, and 3% is during Other months.

The percentages taken together for all the months then show the pattern of annual visitation.

A similar interpretation can be made for the other sites.

Table 7.1-5. Annual Visitation of Respondents per Site.

	Study Area	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
Number of Respondents that Visit during April	50	9	4	9	8	20
Number of Respondents that Visit during May	111	21	10	24	22	34
Number of Respondents that Visit during June	221	50	20	58	30	63
Number of Respondents that Visit during July	248	71	26	55	28	68
Number of Respondents that Visit during August	223	63	22	47	26	65
Number of Respondents that Visit during September	120	25	12	23	17	43
Number of Respondents that Visit during October	61	10	8	11	9	23
Number of Respondents that Visit during Other	30	12	2	2	5	9
Total		261	104	229	145	325
Percentage of Visitation during April		3.45%	3.85%	3.93%	5.52%	6.15%
Percentage of Visitation during May		8.05%	9.62%	10.48%	15.17%	10.46%
Percentage of Visitation during June		19.16%	19.23%	25.33%	20.69%	19.38%
Percentage of Visitation during July		27.20%	25.00%	24.02%	19.31%	20.92%
Percentage of Visitation during August		24.14%	21.15%	20.52%	17.93%	20.00%
Percentage of Visitation during September		9.58%	11.54%	10.04%	11.72%	13.23%
Percentage of Visitation during October		3.83%	7.69%	4.80%	6.21%	7.08%
Percentage of Visitation during Other		4.60%	1.92%	0.87%	3.45%	2.77%

Number of Visits by Respondents per Site

The highest number of visits by respondents occur at Pyramid Lake, at Donner Lake, and at Boca Reservoir. Opposite of this, the lowest number of visits by respondents occur at Prosser Reservoir, and at Stampede Reservoir.

These numbers are shown in Table 7.1-6. At Donner Lake, the 83 respondents indicated that they make 459 visits to the site for an average of 5.5 visits each. At Prosser Reservoir, the 32 respondents indicated that they make 161 visits to the site for an average of 5 visits each. At Stampede Reservoir, the 64 respondents indicated that they make 227 visits to the site for an average of 3.5 visits each. At Boca Reservoir, the 31 respondents indicated that they make 280 visits to the site for an average of 9 visits each. At Pyramid Lake, the 71 respondents indicated that they make 890 visits to the site for an average of 12.5 visits each. The higher numbers for Boca Reservoir and Pyramid Lake reflect that a greater proportion of the respondents were local residents that frequented the site as day use visitors.

Table 7.1-6. Number of Visits by Respondents per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
Number of Visits by Respondents	459	161	227	280	890
Average Number of Visits by Respondents	5.53	5.03	3.55	9.03	12.54

Local and Non-Local Respondents per Site

A higher number of respondents living within the study area were at Boca Reservoir and at Pyramid Lake. Whereas, a higher number of respondents living outside the study area were at Donner Lake, at Prosser Reservoir, and at Stampede Reservoir. Respondents living within the study area are considered as local respondents and respondents living outside the study area are considered as non-local respondents.

The numbers and the percentages of local and non-local respondents per site are provided in Table 7.1-7. At Boca Reservoir, 81% of the respondents were local respondents. At Pyramid Lake, 87% of the respondents were local respondents. The higher number of local respondents at these sites is because these sites are primarily day use sites that draw visitors from Truckee and the Reno-Sparks area. In contrast, at Donner Lake, 71% of the respondents were non-local respondents. At Prosser Reservoir, 84% of the respondents were non-local respondents. At Stampede Reservoir, 70% of the respondents were non-local respondents. The higher number of non-local respondents at these sites is because these sites are primarily camping sites that draw visitors from Sacramento and the San Francisco Bay area.

Table 7.1-7. Local and Non-Local Respondents per Site.

	Donner Lake	Prosper Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
Number of Local Respondents	24	5	19	25	62
Number of Non-Local Respondents	59	27	45	6	9
Percentage of Local Respondents	28.92%	15.63%	29.69%	80.65%	87.32%
Percentage of Non-Local Respondents	71.08%	84.38%	70.31%	19.35%	12.68%

Group Make-Up of Respondents per Site

Average group size of respondents among all sites ranged from 3.66 persons at Prosser Reservoir to 5.9 persons at Pyramid Lake. As per group, the number of adults were greater than the number of children at all sites. The percentage of groups that included children ranged from 45% at Boca Reservoir to 70% at Stampede Reservoir.

This group make-up information is presented in Table 7.1-8. At Donner Lake, the average group size was 5.1 persons of which 3 persons were adults and 65% of the groups included children. At Prosser Reservoir, the average group size was 3.66 persons of which 2.53 persons were adults and 47% of the groups included children. At Stampede Reservoir, the average group size was 4.95 persons of which 3.25 persons were adults and 70% of the groups included children. At Boca Reservoir, the average group size was 5.71 persons of which 4.06 persons were adults and 45% of the groups included children. At Pyramid Lake, the average group size was 5.9 persons of which 3.38 persons were adults and 69% of the groups included children.

Table 7.1-8. Group Make-Up of Respondents per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
Average Group Size of Respondents	5.11	3.66	4.95	5.71	5.90
Average Number of Adults in Group of Respondents	3.00	2.53	3.25	4.06	3.38
Percentage of Groups that include Children	65.06%	46.88%	70.31%	45.16%	69.01%

Camping and Day Use Respondents per Site

The highest percentage of camping respondents were at Prosser Reservoir and at Stampede Reservoir. The largest average group size of camping respondents was at Pyramid Lake. The greatest average numbers of days spent by camping respondents were at Prosser Reservoir and at Boca Reservoir.

This camping respondent information is provided in Table 7.1-9. At Donner Lake, 51% of the respondents were camping respondents having a group size of 5.24 persons with 3.63 days being spent. At Prosser Reservoir, 94% of the respondents were camping respondents having a group size of 3.73 persons with 3.9 days being spent. At Boca Reservoir, 55% of the respondents were camping respondents having a group size of 5.47 persons with 3.65 days being spent. At Pyramid Lake, 27% of the respondents were camping respondents having a group size of 5.53 persons with 2.95 days being spent. At Stampede Reservoir, 100% of the respondents were camping respondents having a group size of 4.95 persons with 4.44 days being spent. Only interviews of camping visitors were made at Stampede Reservoir.

The highest percentage of day use respondents, except for Stampede Reservoir, were at Donner Lake and at Pyramid Lake. The largest average group size of day use respondents was at Pyramid Lake. The greatest average number of hours spent by day use respondents were at Boca Reservoir and at Pyramid Lake.

This day use respondent information is also provided in Table 7.1-9. At Donner Lake, 49% of the respondents were day use respondents having a group size of 4.98 persons with 4.92 hours being spent. At Prosser Reservoir, 6% of the respondents were day use respondents having a group size of 2.50 persons with 3.50 hours being spent. At Boca Reservoir, 45% of the respondents were day use respondents having a group size of 6 persons with 4.28 hours being spent. At Pyramid Lake, 73% of the respondents were day use respondents having a group size of 6.04 persons with 5.42 hours being spent. At Stampede Reservoir, this information is not available because no interviews of day use visitors were made.

Table 7.1-9. Camping and Day Use Respondents per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
Number of Camping Respondents	42	30	64	17	19
Percentage of Camping Respondents	50.60%	93.75%	100.00%	54.84%	26.76%
Average Group Size of Camping Respondents	5.24	3.73	4.95	5.47	5.53
Average Number of Days Spent by Camping Respondents	3.63	3.90	4.44	3.65	2.95
Number of Day Use Respondents	41	2	0	14	52
Percentage of Day Use Respondents	49.40%	6.25%	N.A.	45.16%	73.24%
Average Group Size of Day Use Respondents	4.98	2.50	N.A.	6.00	6.04
Average Number of Hours Spent by Day Use Respondents	4.92	3.50	N.A.	4.28	5.42

Ranking of Reasons to Visit by Respondents per Site

Reasons to visit include importance of decision factors and quality of site characteristics.

The decision factors ranked very important to somewhat unimportant in visiting a reservoir or lake. These factors are activity opportunity, access, crowd level, facilities, water-level, and area setting.

Ranking the importance of decision factors to visit by respondents per site is shown in Table 7.1-10. Activity opportunity is ranked very important by respondents at Prosser Reservoir, at Boca Reservoir, and at Pyramid Lake. Activity opportunity is ranked somewhat important by respondents at Donner Lake and at Stampede Reservoir. Access is ranked very important by respondents at Donner Lake, at Stampede Reservoir, and at Pyramid Lake. Access is ranked somewhat important by respondents at Prosser Reservoir and at Boca Reservoir. Crowd level is ranked very important by respondents at Prosser Reservoir and somewhat important by respondents at Donner Lake, at Stampede Reservoir, at Boca Reservoir, and at Pyramid Lake. Facilities is ranked somewhat important by respondents at Donner Lake, at Prosser Reservoir, at Stampede Reservoir, and at Pyramid Lake. Facilities is ranked somewhat unimportant by respondents at Boca Reservoir. Water-level is ranked very important by respondents at Pyramid Lake and somewhat important by respondents at Donner Lake, at Prosser Reservoir, at Stampede Reservoir, and at Boca Reservoir. Area setting is ranked very important by respondents at Donner Lake, at Prosser Reservoir, at Stampede Reservoir, and at Boca Reservoir. Area setting is ranked somewhat important by respondents at Pyramid Lake.

The site characteristics ranked very good to poor. These site characteristics are activity, access, crowd level, facilities, water-level, and area setting.

Ranking the quality of site characteristics by respondents per site is also shown in Table 7.1-10. Activity opportunity is ranked very good by respondents at Pyramid Lake and good by respondents at Donner Lake, at Prosser Reservoir, at Stampede Reservoir, and at Boca Reservoir. Access is ranked very good by respondents at Donner Lake and good by respondents at Prosser Reservoir, at Stampede Reservoir, at Boca Reservoir, and at Pyramid Lake. Crowd level is ranked good by respondents at all the reservoirs and lakes. Facilities is ranked good by respondents at Donner Lake, at Prosser Reservoir, and at Stampede Reservoir. Facilities is ranked satisfactory by respondents at Boca Reservoir and at Pyramid Lake. Water-level is ranked good by respondents at Donner Lake and at Pyramid Lake. Water-level is ranked poor by respondents at Prosser Reservoir, at Stampede Reservoir, and at Boca Reservoir. Area setting is ranked very good by respondents at Donner Lake and good by respondents at Prosser Reservoir, at Stampede Reservoir, at Boca Reservoir, and at Pyramid Lake.

Table 7.1-10. Ranking of Reasons to Visit by Respondents per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boon Reservoir	Pyramid Lake
Decision Factors /1					
Average Value of Activity Opportunity by Respondents	1.73	1.44	1.50	1.16	1.48
Average Value of Access by Respondents	1.45	1.69	1.44	1.71	1.39
Average Value of Crowd Level by Respondents	1.59	1.44	1.66	1.58	1.66
Average Value of Facilities by Respondents	1.70	2.09	1.98	2.52	2.14
Average Value of Water-Level by Respondents	1.84	1.88	1.55	1.52	1.48
Average Value of Area Setting by Respondents	1.37	1.47	1.38	1.42	1.99
Site Characteristics /2					
Average Value of Activity Opportunity by Respondents	1.62	1.94	2.03	2.29	1.45
Average Value of Access by Respondents	1.35	1.56	1.69	2.13	1.68
Average Value of Crowd Level by Respondents	1.94	1.66	1.86	2.13	2.08
Average Value of Facilities by Respondents	1.59	2.34	2.06	3.00	3.21
Average Value of Water-Level by Respondents	1.84	3.75	3.50	4.06	2.01
Average Value of Area Setting by Respondents	1.28	1.72	1.61	2.03	2.04

1. Ranking: 1=Very Important; 2=Somewhat Important; 3=Somewhat Unimportant; 4=Not Important at All; and, 5=No Opinion.

2. Ranking: 1=Very Good; 2=Good; 3=Satisfactory; 4=Poor; and, 5=Very Poor.

Expenditures by Respondents per Site

Expenditures are the highest amount for respondents at Stampede Reservoir followed by expenditures of respondents at Boca Reservoir, at Donner Lake, at Prosser Reservoir, and at Pyramid Lake. Main expenditures are on groceries, camping fees, and fuel.

The expenditures by respondents are presented as average values in Table 7.1-11. At Donner Lake, respondents have total expenditures of \$115.14 in which the largest portion is on groceries, camping fees, restaurant, other, and fuel. At Prosser Reservoir, respondents have total expenditures of \$111.75 in which the largest portion is on groceries, camping fees, other, and fuel. At Stampede Reservoir, respondents have total expenditures of \$188.74 in which the largest portion is on other, groceries, camping fees, and fuel. At Boca Reservoir, respondents have total expenditures of \$134.46 in which the largest portion is on groceries, other, fuel, and camping fees. At Pyramid Lake, respondents have a total expenditure of \$89.44 in which the largest portion is on groceries, fuel, and camping fees.

Table 7.1-11. Expenditures by Respondents per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boon Reservoir	Pyramid Lake
Average Expenditures on Licenses by Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Expenditures on Camping Fees by Respondents	26.64	19.47	41.12	14.00	7.65
Average Expenditures on Hotel or Motel by Respondents	4.13	0.00	0.00	7.42	0.00
Average Expenditures on Restaurant by Respondents	18.08	7.72	12.47	4.84	0.28
Average Expenditures on Groceries by Respondents	37.36	57.52	55.47	69.77	53.44
Average Expenditures on Equipment and Supplies by Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Expenditures on Rental by Respondents	4.34	0.00	0.00	0.10	1.55
Average Expenditures on Fuel by Respondents	10.24	12.40	20.83	17.68	25.11
Average Expenditures on Other by Respondents	14.35	14.64	58.85	20.65	1.41
Average Total Expenditures by Respondents	\$115.14	\$111.75	\$188.74	\$134.46	\$89.44

Expenditures by Camping Respondents per Site

Expenditures are the highest amount for camping respondents at Boca Reservoir followed by expenditures of camping respondents at Stampede Reservoir, at Donner Lake, at Pyramid Lake, and at Prosser Reservoir. Main expenditures are on groceries, camping fees, other, and fuel.

The expenditures for camping respondents are provided as average values in Table 7.1-12. At Donner Lake, camping respondents have total expenditures of \$181.14 in which the largest portion is on groceries, camping fees, restaurant, other, and fuel. At Prosser Reservoir, camping respondents have total expenditures of \$116.50 in which the largest portion is on groceries, camping fees, other, and fuel. At Stampede Reservoir, camping respondents have total expenditures of \$188.74 in which the largest portion is on other, groceries, camping fees, and fuel. At Boca Reservoir, camping respondents have total expenditures of \$213.89 in which the largest portion is on groceries, other, camping fees, and fuel. At Pyramid Lake, camping respondents have a total expenditure of \$178.47 in which the largest portion is on groceries, fuel, and camping fees.

Expenditures per day by camping respondents is calculated by dividing the expenditures by camping respondents by the number of days spent by camping respondents. At Donner Lake, total expenditures per day are \$49.90. At Prosser Reservoir, total expenditures per day are \$29.87. At Stampede Reservoir, total expenditures per day are \$42.51. At Boca Reservoir, total expenditures per day are \$58.60. At Pyramid Lake, total expenditures per day are \$60.50.

Expenditures per day per person by camping respondents is calculated by dividing the expenditures per day by camping respondent by the average group size of camping respondents. At Donner Lake, total expenditures per day per person are \$9.52. At Prosser Reservoir, total expenditures per day per person are \$8.01. At Stampede Reservoir, total expenditures per day per person are \$8.59. At Boca Reservoir, total expenditures per day per person are \$10.71. At Pyramid Lake, total expenditures per day per person are \$10.94.

Table 7.1-12. Expenditures by Camping Respondents per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boon Reservoir	Pyramid Lake
Average Expenditures on Licenses by Camping Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Expenditures on Camping Fees by Camping Respondents	48.71	20.77	41.12	25.53	16.89
Average Expenditures on Hotel or Motel by Camping Respondents	5.60	0.00	0.00	12.94	0.00
Average Expenditures on Restaurant by Camping Respondents	28.33	8.23	12.47	7.06	0.00
Average Expenditures on Groceries by Camping Respondents	56.96	61.36	55.47	108.59	117.37
Average Expenditures on Equipment and Supplies by Camping Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Expenditures on Rental by Camping Respondents	0.60	0.00	0.00	0.18	0.00
Average Expenditures on Fuel by Camping Respondents	15.58	12.19	20.83	21.94	43.16
Average Expenditures on Other by Camping Respondents	25.36	13.95	58.85	37.65	1.05
Average Total Expenditures by Camping Respondents	\$181.14	\$116.50	\$188.74	\$213.89	\$178.47
Average Expenditures per Day on Licenses by Camping Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Expenditures per Day on Camping Fees by Camping Respondents	13.42	5.33	9.26	6.99	5.73
Average Expenditures per Day on Hotel or Motel by Camping Respondents	1.54	0.00	0.00	3.55	0.00
Average Expenditures per Day on Restaurant by Camping Respondents	7.80	2.11	2.81	1.93	0.00
Average Expenditures per Day on Groceries by Camping Respondents	15.69	15.73	12.49	29.75	39.79
Average Expenditures per Day on Equipment and Supplies by Camping Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Expenditures per Day on Rental by Camping Respondents	0.17	0.00	0.00	0.05	0.00
Average Expenditures per Day on Fuel by Camping Respondents	4.29	3.13	4.69	6.01	14.63
Average Expenditures per Day on Other by Camping Respondents	6.99	3.58	13.25	10.32	0.36
Average Total Expenditures per Day by Camping Respondents	\$49.90	\$29.87	\$42.51	\$58.60	\$60.50
Average Expenditures per Day per Person on Licenses by Camping Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Expenditures per Day per Person on Camping Fees by Camping Respondents	2.56	1.43	1.87	1.28	1.04
Average Expenditures per Day per Person on Hotel or Motel by Camping Respondents	0.29	0.00	0.00	0.65	0.00
Average Expenditures per Day per Person on Restaurant by Camping Respondents	1.49	0.57	0.57	0.35	0.00
Average Expenditures per Day per Person on Groceries by Camping Respondents	2.99	4.22	2.52	5.44	7.19
Average Expenditures per Day per Person on Equipment and Supplies by Camping Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Expenditures per Day per Person on Rental by Camping Respondents	0.03	0.00	0.00	0.01	0.00
Average Expenditures per Day per Person on Fuel by Camping Respondents	0.82	0.84	0.95	1.10	2.65
Average Expenditures per Day per Person on Other by Camping Respondents	1.33	0.96	2.68	1.89	0.06
Average Total Expenditures per Day per Person by Camping Respondents	\$9.52	\$8.01	\$8.59	\$10.71	\$10.94

Expenditures by Day Use Respondents per Site

Expenditures are the highest amount for day use respondents at Pyramid Lake followed by expenditures of day use respondents at Donner Lake, at Prosser Reservoir, and at Boca Reservoir. Main expenditures are on groceries and fuel.

The average expenditures by day use respondents are shown in Table 7.1-13. At Donner Lake, day use respondents have total expenditures of \$47.55 in which the largest portion is on groceries, rental, restaurant, and fuel. At Prosser Reservoir, day use respondents have total expenditures of \$40.50 in which the largest portion is on other and fuel. At Boca Reservoir, day use respondents have total expenditures of \$37.99 in which the largest portion is on groceries and fuel. At Pyramid Lake, day use respondents have a total expenditure of \$56.91 in which the largest portion is on groceries and fuel.

Expenditures per person by day use respondents is calculated by dividing the expenditures by day use respondents by the average group size of day use respondents. At Donner Lake, total expenditures per person are \$9.55. At Prosser Reservoir, total expenditures per person are \$16.20. At Boca Reservoir, total expenditures per person are \$6.33. At Pyramid Lake, total expenditures per person are \$9.42.

Table 7.1-13. Expenditures by Day Use Respondents per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
Average Expenditures on Licenses by Day Use Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Expenditures on Camping Fees by Day Use Respondents	4.04	0.00	N.A.	0.00	4.27
Average Expenditures on Hotel or Motel by Day Use Respondents	2.63	0.00	N.A.	0.71	0.00
Average Expenditures on Restaurant by Day Use Respondents	7.58	0.00	N.A.	2.14	0.38
Average Expenditures on Groceries by Day Use Respondents	17.29	0.00	N.A.	22.64	30.08
Average Expenditures on Equipment and Supplies by Day Use Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Expenditures on Rental by Day Use Respondents	8.18	0.00	N.A.	0.00	2.12
Average Expenditures on Fuel by Day Use Respondents	4.76	15.50	N.A.	12.50	18.52
Average Expenditures on Other by Day Use Respondents	3.07	25.00	N.A.	0.00	1.54
Average Total Expenditures by Day Use Respondents	\$47.55	\$40.50	N.A.	\$37.99	\$56.91
Average Expenditures per Person on Licenses by Day Use Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Expenditures per Person on Camping Fees by Day Use Respondents	0.81	0.00	N.A.	0.00	0.71
Average Expenditures per Person on Hotel or Motel by Day Use Respondents	0.53	0.00	N.A.	0.12	0.00
Average Expenditures per Person on Restaurant by Day Use Respondents	1.52	0.00	N.A.	0.36	0.06
Average Expenditures per Person on Groceries by Day Use Respondents	3.47	0.00	N.A.	3.77	4.98
Average Expenditures per Person on Equipment and Supplies by Day Use Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Expenditures per Person on Rental by Day Use Respondents	1.64	0.00	N.A.	0.00	0.35
Average Expenditures per Person on Fuel by Day Use Respondents	0.96	6.20	N.A.	2.08	3.07
Average Expenditures per Person on Other by Day Use Respondents	0.62	10.00	N.A.	0.00	0.25
Average Total Expenditures per Person by Day Use Respondents	\$9.55	\$16.20	N.A.	\$6.33	\$9.42

Activity Hours per Day by Respondents per Site

Hours per day spent by respondents participating in non-camping activities at all sites ranged from 6.88 hours at Pyramid Lake to 10.31 hours at Stampede Reservoir. Activities of respondents also varied among all sites from that of picnicking, fishing, swimming, boating, fishing from boat, water skiing, jet skiing, biking, hiking, and other activities.

The average activity hours per day by respondents are provided in Table 7.1-14. At Donner Lake, respondents spent 6.95 hours per day participating in activities including picnicking, fishing, swimming, hiking, and other. At Prosser Reservoir, respondents spent 7.47 hours per day participating in activities including picnicking, fishing, hiking, and other. At Stampede Reservoir, respondents spent 10.31 hours per day participating in activities including picnicking, fishing, fishing from boat, and hiking. At Boca Reservoir, respondents spent 7.64 hours per day participating in activities including picnicking, fishing, swimming, and hiking. At Pyramid Lake, respondents spent 6.88 hours per day participating in activities including picnicking, swimming, boating, water skiing, and jet skiing.

Table 7.1-14. Activity Hours per Day by Respondents per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
<i>Average Activity Hours per Day spent Picnicking by Respondents</i>	2.10	2.00	2.44	2.03	1.22
<i>Average Activity Hours per Day spent Camping by Respondents</i>	N.A.	N.A.	N.A.	N.A.	N.A.
<i>Average Activity Hours per Day spent Fishing by Respondents</i>	0.73	1.53	1.52	1.90	0.02
<i>Average Activity Hours per Day spent Swimming by Respondents</i>	1.30	0.38	0.75	0.89	1.85
<i>Average Activity Hours per Day spent Boating by Respondents</i>	0.24	0.06	0.30	0.33	0.80
<i>Average Activity Hours per Day spent Fishing from Boat by Respondents</i>	0.06	0.84	2.66	0.46	0.09
<i>Average Activity Hours per Day spent Water Skiing by Respondents</i>	0.12	0.00	0.31	0.32	1.28
<i>Average Activity Hours per Day spent Jet Skiing by Respondents</i>	0.12	0.00	0.06	0.58	1.45
<i>Average Activity Hours per Day spent Rafting by Respondents</i>	N.A.	N.A.	N.A.	N.A.	N.A.
<i>Average Activity Hours per Day spent Kayaking by Respondents</i>	N.A.	N.A.	N.A.	N.A.	N.A.
<i>Average Activity Hours per Day spent Biking by Respondents</i>	0.53	0.41	0.47	0.25	0.03
<i>Average Activity Hours per Day spent Hiking by Respondents</i>	0.73	1.00	1.07	0.71	0.04
<i>Average Activity Hours per Day spent on Other activities by Respondents</i>	1.02	1.25	0.73	0.16	0.10
Total Activity Hours per Day by Respondents	6.95	7.47	10.31	7.64	6.88
Total Activity Hours per Day spent on Non-Camping Activities by Respondents	6.95	7.47	10.31	7.64	6.88

Activity Hours per Day by Camping Respondents per Site

Hours per day spent by camping respondents participating in non-camping activities at all sites ranged from 7.73 hours at Prosser Reservoir to 10.96 hours at Pyramid Lake. Activities of camping respondents also varied among all sites from that of picnicking, fishing, swimming, boating, fishing from boat, water skiing, jet skiing, biking, hiking, and other activities.

The average activity hours per day by camping respondents are presented in Table 7.1-15. At Donner Lake, camping respondents spent 8.95 hours per day participating in activities including picnicking, fishing, swimming, hiking, and other. At Prosser Reservoir, camping respondents spent 7.73 hours per day participating in activities including picnicking, fishing, hiking, and other. At Stampede Reservoir, camping respondents spent 10.31 hours per day participating in activities including picnicking, fishing, swimming, fishing from boat, hiking, and other. At Boca Reservoir, camping respondents spent 10.38 hours per day participating in activities including picnicking, fishing, swimming, fishing from boat, and hiking. At Pyramid Lake, camping respondents spent 10.96 hours per day participating in activities including picnicking, swimming, boating, water skiing, and jet skiing.

Table 7.1-15. Activity Hours per Day by Camping Respondents per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
Average Activity Hours per Day spent Picnicking by Camping Respondents	2.67	2.13	2.44	2.85	2.05
Average Activity Hours per Day spent Camping by Camping Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Activity Hours per Day spent Fishing by Camping Respondents	1.10	1.50	1.52	2.68	0.03
Average Activity Hours per Day spent Swimming by Camping Respondents	1.45	0.40	0.75	1.31	3.32
Average Activity Hours per Day spent Boating by Camping Respondents	0.14	0.07	0.30	0.54	1.32
Average Activity Hours per Day spent Fishing from Boat by Camping Respondents	0.07	0.80	2.66	0.78	0.35
Average Activity Hours per Day spent Water Skiing by Camping Respondents	0.02	0.00	0.31	0.34	2.14
Average Activity Hours per Day spent Jet Skiing by Camping Respondents	0.00	0.00	0.06	0.12	1.53
Average Activity Hours per Day spent Rafting by Camping Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Activity Hours per Day spent Kayaking by Camping Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Activity Hours per Day spent Biking by Camping Respondents	0.79	0.43	0.47	0.47	0.03
Average Activity Hours per Day spent Hiking by Camping Respondents	1.31	1.07	1.07	1.23	0.08
Average Activity Hours per Day spent on Other activities by Camping Respondents	1.40	1.33	0.73	0.06	0.11
Total Activity Hours per Day by Camping Respondents	8.95	7.73	10.31	10.38	10.96
Total Activity Hours per Day spent on Non-Camping Activities by Camping Respondents	8.95	7.73	10.31	10.38	10.96

Activity Hours per Day by Day Use Respondents per Site

Hours per day spent by day use respondents participating in activities at all sites ranged from 3.50 hours at Prosser Reservoir to 5.42 hours at Pyramid Lake. Activities of day use respondents also varied among all sites from that of picnicking, fishing, swimming, boating, fishing from boat, water skiing, jet skiing, biking, hiking, and other activities.

The average activity hours per day by day use respondents are shown in Table 7.1-16. At Donner Lake, day use respondents spent 4.92 hours per day participating in activities including picnicking, fishing, swimming, and other. At Prosser Reservoir, day use respondents spent 3.50 hours per day participating in activities including fishing and fishing from boat. At Boca Reservoir, day use respondents spent 4.28 hours per day participating in activities including picnicking, fishing, swimming, and jet skiing. At Pyramid Lake, day use respondents spent 5.42 hours per day participating in activities including picnicking, swimming, boating, water skiing, and jet skiing.

Table 7.1-16. Activity Hours per Day by Day Use Respondents per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
Average Activity Hours per Day spent Picnicking by Day Use Respondents	1.51	0.00	N.A.	1.02	0.92
Average Activity Hours per Day spent Camping by Day Use Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Activity Hours per Day spent Fishing by Day Use Respondents	0.37	2.00	N.A.	0.95	0.02
Average Activity Hours per Day spent Swimming by Day Use Respondents	1.15	0.00	N.A.	0.38	1.31
Average Activity Hours per Day spent Boating by Day Use Respondents	0.34	0.00	N.A.	0.07	0.62
Average Activity Hours per Day spent Fishing from Boat by Day Use Respondents	0.05	1.50	N.A.	0.07	0.00
Average Activity Hours per Day spent Water Skiing by Day Use Respondents	0.22	0.00	N.A.	0.29	0.96
Average Activity Hours per Day spent Jet Skiing by Day Use Respondents	0.24	0.00	N.A.	1.14	1.43
Average Activity Hours per Day spent Rafting by Day Use Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Activity Hours per Day spent Kayaking by Day Use Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Activity Hours per Day spent Biking by Day Use Respondents	0.27	0.00	N.A.	0.00	0.03
Average Activity Hours per Day spent Hiking by Day Use Respondents	0.15	0.00	N.A.	0.07	0.03
Average Activity Hours per Day spent on Other activities by Day Use Respondents	0.62	0.00	N.A.	0.29	0.10
Total Activity Hours per Day by Day Use Respondents	4.92	3.50	N.A.	4.28	5.42

Indicated Number of Visits by Respondents at Alternative Water Levels per Site

Respondents, at all sites not including Pyramid Lake, indicated more visits at higher water levels and less visits at lower water levels.

The indicated average number of visits by respondents at alternative water levels are presented in Table 7.1-17.

Alternative water levels are 1 for the highest and either 5 or 11 for the lowest. At Donner Lake, water level 1 is 9,660 acre-feet or maximum storage and water level 5 is 5,796 acre-feet or minimum storage for June, July, and August. At Prosser Reservoir, water level 1 is 29,840 acre-feet or maximum storage and water level 11 is 0 acre-feet or no storage. At Stampede Reservoir, water level 1 is 226,000 acre-feet or maximum storage and water level 11 is 0 acre-feet or no storage. At Boca Reservoir, water level 1 is 40,870 acre-feet or maximum storage and water level 11 is 0 acre-feet or no storage.

Given the alternative water levels, the number of visits by respondents vary accordingly. At Donner Lake, respondents indicated 3.11 visits at water level 1 to 2.57 visits at water level 5. At Prosser Reservoir, respondents indicated 3.03 visits at water level 1 to .25 visits at water level 11. At Stampede Reservoir, respondents indicated 3.08 visits at water level 1 to .48 visits at water level 11. At Boca Reservoir, respondents indicated 5.55 visits at water level 1 to .26 visits at water level 11.

Assuming that there is 100% visitation at alternative water level 1, the average number of visits by respondents at other water levels are also provided in relative percentage terms. At Donner Lake, visitation drops from 100% at water level 1 to 83% at water level 5. At Prosser Reservoir, visitation holds constant at 100% for water levels 1 and 2 and then drops to 8% at water level 11. At Stampede Reservoir, visitation drops from 100% at water level 1 to 16% at water level 11. At Boca Reservoir, visitation holds constant at 100% for water levels 1 and 2 and then drops to 5% at water level 11.

Table 7.1-17. Indicated Number of Visits by Respondents at Alternative Water Levels per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir
Acre-Feet of Storage at Alternative Water Level 1	9,660	29,840	226,500	40,870
Acre-Feet of Storage at Alternative Water Level 2	8,694	26,856	203,850	36,783
Acre-Feet of Storage at Alternative Water Level 3	7,728	23,872	181,200	32,696
Acre-Feet of Storage at Alternative Water Level 4	6,762	20,888	158,550	28,609
Acre-Feet of Storage at Alternative Water Level 5	5,796	17,904	135,900	24,522
Acre-Feet of Storage at Alternative Water Level 6		14,920	113,250	20,435
Acre-Feet of Storage at Alternative Water Level 7		11,936	90,600	16,348
Acre-Feet of Storage at Alternative Water Level 8		8,952	67,950	12,261
Acre-Feet of Storage at Alternative Water Level 9		5,968	45,300	8,174
Acre-Feet of Storage at Alternative Water Level 10		2,984	22,650	4,087
Acre-Feet of Storage at Alternative Water Level 11		0	0	0
Average Number of Visits by Respondents at Alternative Water Level 1	3.11	3.03	3.08	5.55
Average Number of Visits by Respondents at Alternative Water Level 2	3.07	3.03	3.02	5.55
Average Number of Visits by Respondents at Alternative Water Level 3	2.94	2.94	2.94	5.06
Average Number of Visits by Respondents at Alternative Water Level 4	2.72	2.78	2.77	4.68
Average Number of Visits by Respondents at Alternative Water Level 5	2.57	2.59	2.61	4.03
Average Number of Visits by Respondents at Alternative Water Level 6		2.50	2.47	3.68
Average Number of Visits by Respondents at Alternative Water Level 7		2.16	1.88	2.90
Average Number of Visits by Respondents at Alternative Water Level 8		2.06	1.84	2.81
Average Number of Visits by Respondents at Alternative Water Level 9		0.47	0.63	1.84
Average Number of Visits by Respondents at Alternative Water Level 10		0.25	0.55	1.29
Average Number of Visits by Respondents at Alternative Water Level 11		0.25	0.48	0.26
Percentage of Visitation of Respondents at Alternative Water Level 1	100.00%	100.00%	100.00%	100.00%
Percentage of Visitation of Respondents at Alternative Water Level 2	98.71%	100.00%	98.05%	100.00%
Percentage of Visitation of Respondents at Alternative Water Level 3	94.53%	97.03%	95.45%	91.17%
Percentage of Visitation of Respondents at Alternative Water Level 4	87.46%	91.75%	89.94%	84.32%
Percentage of Visitation of Respondents at Alternative Water Level 5	82.64%	85.48%	84.74%	72.61%
Percentage of Visitation of Respondents at Alternative Water Level 6		82.51%	80.19%	66.31%
Percentage of Visitation of Respondents at Alternative Water Level 7		71.29%	61.04%	52.25%
Percentage of Visitation of Respondents at Alternative Water Level 8		67.99%	59.74%	50.63%
Percentage of Visitation of Respondents at Alternative Water Level 9		15.51%	20.45%	33.15%
Percentage of Visitation of Respondents at Alternative Water Level 10		8.25%	17.86%	23.24%
Percentage of Visitation of Respondents at Alternative Water Level 11		8.25%	15.58%	4.68%

Site Substitution of Respondents per Site

A high number of respondents indicated that they would substitute an alternative site for their preferred site when they could no longer visit their preferred site because of water level.

Site substitution of respondents per site is shown in Table 7.1-18. The number of respondents that indicated site substitution are 57 at Donner Lake, 27 at Prosser Reservoir, 53 at Stampede Reservoir, 28 at Boca Reservoir, and, 66 at Pyramid Lake. For respondents at Donner Lake, site substitution to Lake Tahoe is 41%, to Prosser Reservoir is 3%, to Stampede Reservoir is 11%, to Boca Reservoir is 3%, to Pyramid Lake is 3%, and, to Other Sites is 38%. For respondents at Prosser Reservoir, site substitution to Donner Lake is 38%, to Stampede Reservoir is 19%, to Pyramid Lake is 8%, and, to Other Sites is 35%. For respondents at Stampede Reservoir, site substitution to Lake Tahoe is 4%, to Donner Lake is 30%, to Prosser Reservoir is 3%, to Boca Reservoir is 1%, to Pyramid Lake is 10%, and, to Other Sites is 51%. For respondents at Boca Reservoir, site substitution to Lake Tahoe is 6%, to Donner Lake is 35%, to Prosser Reservoir is 4%, to Stampede Reservoir is 21%, to Pyramid Lake is 21%, and, to Other Sites is 13%. For respondents at Pyramid Lake, site substitution to Lake Tahoe is 19%, to Donner Lake is 30%, to Stampede Reservoir is 9%, to Boca Reservoir is 17%, and, to Other Sites is 25%. Other Sites are located outside the Truckee River Basin.

Table 7.1-18. Site Substitution of Respondents per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
Number of Respondents indicating Site Substitution	57	27	53	28	66
Percentage of Respondents indicating Site Substitution	68.70%	84.40%	82.90%	90.30%	93.00%
Number of Respondents indicating Site Substitution to Lake Tahoe	25	0	3	3	17
Number of Respondents indicating Site Substitution to Upper Truckee River	0	0	0	0	0
Number of Respondents indicating Site Substitution to Donner Lake	N.A.	14	21	18	27
Number of Respondents indicating Site Substitution to Prosser Reservoir	2	N.A.	2	2	0
Number of Respondents indicating Site Substitution to Stampede Reservoir	7	7	N.A.	11	8
Number of Respondents indicating Site Substitution to Boca Reservoir	2	0	1	N.A.	15
Number of Respondents indicating Site Substitution to Lower Truckee River	0	0	0	0	0
Number of Respondents indicating Site Substitution to Pyramid Lake	2	3	7	11	N.A.
Number of Respondents indicating Site Substitution to Other Sites /1	23	13	36	7	22
Percentage of Site Substitution to Lake Tahoe	40.98%	0.00%	4.29%	5.77%	19.10%
Percentage of Site Substitution to Upper Truckee River	0.00%	0.00%	0.00%	0.00%	0.00%
Percentage of Site Substitution to Donner Lake	0.00%	37.84%	30.00%	34.62%	30.34%
Percentage of Site Substitution to Prosser Reservoir	3.28%	0.00%	2.86%	3.85%	0.00%
Percentage of Site Substitution to Stampede Reservoir	11.48%	18.92%	0.00%	21.15%	8.99%
Percentage of Site Substitution to Boca Reservoir	3.28%	0.00%	1.43%	0.00%	16.85%
Percentage of Site Substitution to Lower Truckee River	0.00%	0.00%	0.00%	0.00%	0.00%
Percentage of Site Substitution to Pyramid Lake	3.28%	8.11%	10.00%	21.15%	0.00%
Percentage of Site Substitution to Other Sites /1	37.70%	35.14%	51.43%	13.46%	24.72%

1. Other sites are located outside the Truckee River Basin.

Willingness of Respondents to Pay to Maintain Water Level per Site

Respondents at Pyramid Lake show a greater willingness to pay not to have the water level drop than do respondents at any other site.

The willingness to pay information is provided in Table 7.1-19. At Donner Lake, with 34% of respondents indicating a "Zero" response, the average value for respondents is \$16.97. At Prosser Reservoir, with 47% of the respondents indicating a "Zero" response, the average value for respondents is \$16.58. At Stampede Reservoir, with 42% of the respondents indicating a "Zero" response, the average value for respondents is \$14.68. At Boca Reservoir, with 19% of the respondents indicating a "Zero" response, the average value for respondents is \$18.85. At Pyramid Lake, with 15% of the respondents indicating a "Zero" response, the average value for respondents is \$25.63.

Table 7.1-19. Willingness of Respondents to Pay to Maintain Water Level per Site.

	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir	Pyramid Lake
Average Value for Respondents	\$16.97	\$16.58	\$14.68	\$18.85	\$25.63
Percentage of Respondents indicating a "Zero" Response	33.73%	46.88%	42.19%	19.35%	15.49%
Average Value for Local Respondents	N.A.	N.A.	N.A.	N.A.	N.A.
Average Value for Non-Local Respondents	N.A.	N.A.	N.A.	N.A.	N.A.

Age Brackets of Respondents

The greatest number of respondents were between 31 and 50 years of age.

Presented in Table 7.1-20 are the age brackets with corresponding number of respondents and percentage of respondents. Of the 281 respondents, 1% were under 16 years of age, 4% were between 16 and 20 years of age, 15% were between 21 and 30 years of age, 34% were between 31 and 40 years of age, 28% were between 41 and 50 years of age, 10% were between 51 and 60 years of age, 7% were between 61 and 70 years of age, and 2% were over 70 years of age.

Table 7.1-20. Age Brackets of Respondents.

	Study Area
Number of Respondents under 16 Years of Age	2
Number of Respondents between 16 - 20 Years of Age	10
Number of Respondents between 21 - 30 Years of Age	41
Number of Respondents between 31 - 40 Years of Age	96
Number of Respondents between 41 - 50 Years of Age	78
Number of Respondents between 51 - 60 Years of Age	29
Number of Respondents between 61 - 70 Years of Age	20
Number of Respondents over 70 Years of Age	5
Percentage of Respondents under 16 Years of Age	0.71%
Percentage of Respondents between 16 - 20 Years of Age	3.56%
Percentage of Respondents between 21 - 30 Years of Age	14.59%
Percentage of Respondents between 31 - 40 Years of Age	34.16%
Percentage of Respondents between 41 - 50 Years of Age	27.76%
Percentage of Respondents between 51 - 60 Years of Age	10.32%
Percentage of Respondents between 61 - 70 Years of Age	7.12%
Percentage of Respondents over 70 Years of Age	1.78%

Education Levels of Respondents

The greatest number of respondents held a college level of education.

Provided in Table 7.1-21 are the education levels with corresponding number of respondents and percentage of respondents. Of only 280 respondents, 1% held a elementary school level of education, 24% held a high school level of education, 10% held a technical school level of education, 25% held a 2 years of college level of education, 25% held a 4 years of college level of education, and 15% held over 4 years of college level of education.

Table 7.1-21. Education Levels of Respondents.

	Study Area
Number of Respondents with a Elementary School Level of Education	2
Number of Respondents with a High School Level of Education	68
Number of Respondents with a Technical School Level of Education	28
Number of Respondents with a 2 Years of College Level of Education	70
Number of Respondents with a 4 Years of College Level of Education	69
Number of Respondents with a Over 4 Years of College Level of Education	43
Percentage of Respondents with a Elementary School Level of Education	0.71%
Percentage of Respondents with a High School Level of Education	24.29%
Percentage of Respondents with a Technical School Level of Education	10.00%
Percentage of Respondents with a 2 Years of College Level of Education	25.00%
Percentage of Respondents with a 4 Years of College Level of Education	24.64%
Percentage of Respondents with a Over 4 Years of College Level of Education	15.36%

Household Income Levels of Respondents

The greatest number of respondents had a household income level of \$26,000 to \$75,000 per year.

Shown in Table 7.1-22 are the household income levels with corresponding number of respondents and percentage of respondents. Of only 262 respondents, 2% had a household income level below \$10,000 per year, 11% had a household income level of \$10,000 to \$25,000 per year, 38% had a household income level of \$26,000 to \$50,000 per year, 27% had a household income level of \$51,000 to \$75,000 per year, 13% had a household income level of \$76,000 to \$100,000 per year, and 9% had a household income level of over \$100,000 per year.

Table 7.1-22. Household Income Levels of Respondents.

	Study Area
Number of Respondents with a Household Income Level Below \$10,000 per Year	5
Number of Respondents with a Household Income Level of \$10,000 - \$25,000 per Year	28
Number of Respondents with a Household Income Level of \$26,000 - \$50,000 per Year	100
Number of Respondents with a Household Income Level of \$51,000 - \$75,000 per Year	71
Number of Respondents with a Household Income Level of \$76,000 - \$100,000 per Year	35
Number of Respondents with a Household Income Level of Over \$100,000 per Year	23
Percentage of Respondents with a Household Income Level Below \$10,000 per Year	1.91%
Percentage of Respondents with a Household Income Level of \$10,000 - \$25,000 per Year	10.69%
Percentage of Respondents with a Household Income Level of \$26,000 - \$50,000 per Year	38.17%
Percentage of Respondents with a Household Income Level of \$51,000 - \$75,000 per Year	27.10%
Percentage of Respondents with a Household Income Level of \$76,000 - \$100,000 per Year	13.36%
Percentage of Respondents with a Household Income Level of Over \$100,000 per Year	8.78%

7.2. Estimation of the Expenditure Function

Expenditures of camping and day use visitors at each of the sites are calculated using an expenditure function. Specification of the expenditure function and estimation of the expenditure function are as follows.

Specification of the Expenditure Function

The expenditure function is an important ingredient of the modern theory of consumer behavior. It shows the minimal expenditures necessary to achieve a given utility level for a particular set of prices. The properties of the expenditure function in the areas of theoretical and applied analysis of consumer behavior are developed in the studies by Barton and Bohm (1982), Deaton and Muelbauer (1980), Hicks (1946), Samuelson (1947), Silberberg (1978), Theil (1975), and Varian (1992). Let $E (P, U)$ be an expenditure function, where P is a vector of commodity prices and U is a given level of utility. The expenditure function is the solution to the following problem:

$$E (P, U) = \text{Min } PX \quad (7.2-1)$$

such that $U (X) \geq U$

where X is a vector of non-negative quantities of goods. The solution to this optimization problem is the expenditure function that gives the minimum cost of achieving the fixed level of utility. For the expenditure function $E (P, U)$ to be well behaved, it must have the following properties: (i) $E (P, U)$ is non decreasing in P , (ii) $E (P, U)$ is homogeneous of the degree 1 in P , (iii) $E (P, U)$ is concave in P , (iv) $E (P, U)$ is continuous in P , for $P > 0$, and (v) if $X (P, U)$ is the expenditure-minimizing bundle necessary to achieve utility level U at prices P , then $X (P, U) = \delta E (P, U) / \delta P$ assuming the derivative exists and that $P > 0$.

The application of the expenditure function in empirical studies of consumer behavior requires the availability of observed market prices on goods and the existence of a well-behaved utility function. In the area of demand for recreation activities, there are no market-based transactions to determine observed market prices. Consequently, the notion of a regular utility function has to be modified in developing the expenditure function for the recreation activities. Let F be a vector of the time spent on a series of recreational activities by an individual at a particular site. The indirect utility function V for recreational activities for this individual is:

$$V = V (F, S, I) \quad (7.2-2)$$

where S is a vector of site characteristics that captures the substitutability of visits across various sites and I is the total budget allocated by an individual to participate in all the recreational activities included in F . The expenditure function E dual to the indirect utility function in (7.2-2) is the minimum expenditure required for the individual to participate in all the recreational activities in F , given the site characteristics in S . The expenditure function E derived from (7.2-2) is:

$$E = I = V^{-1} (F, S) \quad (7.2-3)$$

The expenditure function in (7.2-3) can also be modified to include the variable of the total number of visitors to the site. Let N be the total number of visitors. Then the expenditures function is:

$$E = V^{-1} (F, S, N) \quad (7.2-4)$$

The specification of the expenditure function in (7.2-4) is an empirical issue and it could be determined upon a estimation model selection technique, e.g., the Box-Cox estimation technique. One notable feature of the expenditure function in (7.2-4) is that it can be used to estimate expenditures of recreational activities at a particular site.

The expenditure function in (7.2-4) is used to evaluate the expenditures of recreational activities at the following seven sites in California and Nevada: Upper Truckee River, Donner Lake, Prosser Reservoir, Stampede Reservoir, Boca Reservoir, Lower Truckee River, and Pyramid Lake. The attributes of the characteristics of each site are captured by including dummy variable for each site in S. The definition of the dummy variables included in S are: UTR = 1 if the visitation site is Upper Truckee River and 0 otherwise; DL = 1 if the visitation site is Donner Lake and 0 otherwise; PR = 1 if the visitation site is Prosser Reservoir and 0 otherwise; SR = 1 if the visitation site is Stampede Reservoir and 0 otherwise; BR = 1 if the visitation site is Boca Reservoir and 0 otherwise; LTR = 1 if the visitation site is Lower Truckee River and 0 otherwise; and, PL = 1 if the visitation site is Pyramid Lake and 0 otherwise. The hours spent on each of the following eleven recreational activities are included in F. The activities were determined according to their availability and popularity at the sites. The activities are: picnicking, camping, fishing, swimming, boating, fishing from boat, water skiing, jet skiing, rafting, kayaking, biking, hiking, and other activities. To capture the effect of the type of visitor at a given site on their expenditures, i.e., camping versus day use, a dummy variable D, defined as D = 1 if camping visitor and 0 if day use visitor, is included in the expenditure function in (7.2-4). Following the categorization of expenditures on the recreation survey, the expenditures by a visitor to a given site are identified as licenses, camping fees, hotel or motel, restaurant, groceries, equipment and supplies, rental, fuel, and other. Using the above specification of the variables, the expenditure function in (7.2-4) can now be presented as:

$$E_i = V^{-1} (UTR, DL, PR, SR, BR, LTR, PL, D, \sum_{j=1}^{13} F_j, N); i = 1, \dots, 7 \quad (7.2-5)$$

The functional form specification of the expenditure function in (7.2-5) is an empirical issue and it will be determined using the Box-Cox flexible functional form technique. The Box-Cox specification of the expenditure function in (7.2-5) is:

$$\frac{E_i^\lambda - 1}{\lambda} = \beta_1 UTR + \beta_2 DL + \beta_3 PR + \beta_4 SR + \beta_5 BR + \beta_6 LTR + \beta_7 PL + \beta_8 D \quad (7.2-6)$$

$$+ \sum_{j=1}^9 \beta_j \left(\frac{F_j^\lambda - 1}{\lambda} \right) + \beta_{22} \left(\frac{N^\lambda - 1}{\lambda} \right) + U$$

where U is the stochastic error term, β is the slope parameter, and λ is the transformation parameter. The transformation parameter may take a wide range of values that would determine the particular functional form that the variable subject to the Box-Cox transformation will assume. For example, one gets a logarithmic transformation for a variable if λ is equal to zero. All of the coefficients of the expenditure function in (7.2-5), including λ , will be estimated using the estimation of the following log-likelihood function:

$$L(\lambda, \beta, \sigma^2; E, X) = -\frac{T}{2} \ln(2\pi\sigma^2) - \frac{1}{2\sigma^2} (E^\lambda - X^\lambda B)' (E^\lambda - X^\lambda B) \quad (7.2-7)$$

$$+ \ln(J); \text{ and } J = \det \left[\frac{\partial E^\lambda}{\partial E} \right] = \prod_{t=1}^T E_t^{\lambda-1}$$

where X is a vector of observations on all the exogenous variables, B is a vector of all the slope parameters to be estimated, and T is the number of observations.

Estimation of the Expenditure Function

The data collected through the recreation survey for the seven sites is used to estimate the expenditure function in (7.2-6). A total number of 432 out of the 443 complete questionnaires are used in the estimation. The initial diagnosis of the data revealed that there are a large number of zeros on most of the recreational activities and a number of expenditure categories making the estimation of the expenditure function in its generalized form in (7.2-6) impossible. A number of alternatives to combine some of the recreational activities are tried to estimate a modified form of the expenditure function in (7.2-6). All of these attempts resulted into some difficulties in estimation of the expenditure function in (7.2-6).

The final modified form of the expenditure function in (7.2-6) that provides meaningful estimation results is:

$$\frac{E^\lambda - 1}{\lambda} = \beta_1 UTR + \beta_2 DL + \beta_3 PR + \beta_4 SR + \beta_5 BR + \beta_6 LTR + \beta_7 PL + \beta_8 D \quad (7.2-8)$$

$$+ \beta_9 \left(\frac{F^\lambda - 1}{\lambda} \right) + \beta_{10} \left(\frac{N^\lambda - 1}{\lambda} \right) + U$$

The expenditure function expressed in simple notation becomes:

$$\ln E = \beta_1 UTR + \beta_2 DL + \beta_3 PR + \beta_4 SR + \beta_5 BR + \beta_6 LTR + \beta_7 PL + \beta_8 D \quad (7.2-9)$$

$$+ \beta_9 \ln F + \beta_{10} \ln N + U$$

where E is the sum of the nine expenditure categories per day, F is the sum of the hours spent per day by a visitor on the thirteen categories of recreational activities, and N is the group size. The Ln is an abbreviation for natural logarithm.

Using the survey observations on the variables E, F, N, the seven location dummy variables, and the type of visitor dummy variable, the expenditure function in (7.2-8) or (7.2-9) is estimated having the following results.

$$\begin{aligned} \text{LnE} = & 3.5638\text{UTR} + 2.7958\text{DL} + 2.8436\text{PR} + 3.0767\text{SR} + 3.0267\text{BR} & (7.2-10) \\ & (11.44) \quad (11.07) \quad (8.43) \quad (11.42) \quad (11.93) \\ & + 2.8453\text{LTR} + 3.0900\text{PL} - 0.2791\text{D} + 0.1653\text{LnF} + 0.3388\text{LnN} \\ & (7.85) \quad (13.45) \quad (-1.98) \quad (1.43) \quad (4.30) \end{aligned}$$

The numbers in the parentheses are the asymptotic t-ratios for 422 degrees of freedom. The adjusted R^2 is 0.0659 for the 432 observations. The 443 observations were edited down to 432. Observations that were deleted were observations having a zero for total expenditures, or a zero for total recreation activity hours, or a zero for group size. The camping and day use visitor expenditure function observations are given in Table 7.2-1.

The maximum likelihood (ML) ratio test is then used to check the validity of alternative functional specifications of the expenditure function for specific value of λ , i.e., logarithmic ($\lambda = 0$) and linear ($\lambda = 1$) functional forms. Let S denote the parameter space under the Box-Cox specification and s denote the subspace of S restricted by the null hypothesis (H^0). The ML ratio test to test for a given functional form under H^0 is a large sample test and can be conducted as follows:

$$d = -2 [L (S) - L (s)] \quad (7.2-11)$$

where $L (S)$ is the maximum of the log likelihood function under S and $L (s)$ is the maximum value of the log likelihood function under s. If H^0 is true, the statistic d has the limiting chi-squared (χ^2) with n degrees of freedom, where n is the number of restrictions imposed by H^0 .

The maximum likelihood estimation of λ in (7.2-8) is 0.07 with the maximum of the log likelihood function $L(S)$ of -803.568 . Using estimates of the maximum log likelihood function of λ , $L(s)$ for the logarithmic and linear specifications of the expenditure function, the test statistic in (7.2-11) is calculated. The test results provide evidence to accept $H^0: \lambda = 0$ and to reject $H^0: \lambda = 1$ against the alternative hypothesis that $H^0: \lambda = 0.07$. In other words, the final functional specification of the expenditure function is in logarithmic functional form.

The estimated expenditure function predicts the logarithm of the average expenditures per day at a particular site for both camping and day use visitors for given values of the logarithm of their hours of non-camping recreation activity and the logarithm of their group size. Then the average expenditures per day are determined by taking the anti-log of the logarithm of the average expenditures. This procedure is shown below by site.

Upper Truckee River

Camping Visitor Group Expenditures per Day

$$\begin{aligned} \text{LnE} &= 3.5638(1) + 2.7958(0) + 2.8436(0) + 3.0767(0) + 3.0267(0) \\ &\quad + 2.8453(0) + 3.0900(0) - 0.2791(1) + 0.1653\text{Ln}(5.50) + 0.3388\text{Ln}(3.47) \end{aligned}$$

$$\text{LnE} = 3.5638 - 0.2791 + 0.1653(1.70) + 0.3388(1.24)$$

$$\text{LnE} = 3.9881$$

$$E = \$53.95$$

Day Use Visitor Group Expenditures per Day

$$\begin{aligned} \text{LnE} &= 3.5638(1) + 2.7958(0) + 2.8436(0) + 3.0767(0) + 3.0267(0) \\ &\quad + 2.8453(0) + 3.0900(0) - 0.2791(0) + 0.1653\text{Ln}(3.00) + 0.3388\text{Ln}(5.50) \end{aligned}$$

$$\text{LnE} = 3.5638 + 0.1653(1.10) + 0.3388(1.70)$$

$$\text{LnE} = 4.3231$$

$$E = \$75.42$$

Donner Lake

Camping Visitor Group Expenditures per Day

$$\begin{aligned} \text{LnE} &= 3.5638(0) + 2.7958(1) + 2.8436(0) + 3.0767(0) + 3.0267(0) \\ &\quad + 2.8453(0) + 3.0900(0) - 0.2791(1) + 0.1653\text{Ln}(8.29) + 0.3388\text{Ln}(5.24) \end{aligned}$$

$$\text{LnE} = 2.7958 - 0.2791 + 0.1653(2.12) + 0.3388(1.66)$$

$$\text{LnE} = 3.4276$$

$$E = \$30.80$$

Day Use Visitor Group Expenditures per Day

$$\begin{aligned} \text{LnE} &= 3.5638(0) + 2.7958(1) + 2.8436(0) + 3.0767(0) + 3.0267(0) \\ &\quad + 2.8453(0) + 3.0900(0) - 0.2791(0) + 0.1653\text{Ln}(4.87) + 0.3388\text{Ln}(4.98) \end{aligned}$$

$$\text{LnE} = 2.7958 + 0.1653(1.58) + 0.3388(1.61)$$

$$\text{LnE} = 3.6014$$

$$E = \$36.65$$

Prosser Reservoir

Camping Visitor Group Expenditures per Day

$$\begin{aligned} \text{LnE} &= 3.5638(0) + 2.7958(0) + 2.8436(1) + 3.0767(0) + 3.0267(0) \\ &\quad + 2.8453(0) + 3.0900(0) - 0.2791(1) + 0.1653\text{Ln}(7.67) + 0.3388\text{Ln}(3.73) \end{aligned}$$

$$\text{LnE} = 2.8436 - 0.2791 + 0.1653(2.04) + 0.3388(1.32)$$

$$\text{LnE} = 3.3473$$

$$E = \$28.43$$

Day Use Visitor Group Expenditures per Day

$$\begin{aligned} \text{LnE} &= 3.5638(0) + 2.7958(0) + 2.8436(1) + 3.0767(0) + 3.0267(0) \\ &\quad + 2.8453(0) + 3.0900(0) - 0.2791(0) + 0.1653\text{Ln}(3.38) + 0.3388\text{Ln}(3.13) \end{aligned}$$

$$\text{LnE} = 2.8436 + 0.1653(1.22) + 0.3388(1.14)$$

$$\text{LnE} = 3.4316$$

$$E = \$30.93$$

Stampede Reservoir

Camping Visitor Group Expenditures per Day

$$\begin{aligned} \text{LnE} &= 3.5638(0) + 2.7958(0) + 2.8436(0) + 3.0767(1) + 3.0267(0) \\ &\quad + 2.8453(0) + 3.0900(0) - 0.2791(1) + 0.1653\text{Ln}(7.82) + 0.3388\text{Ln}(5.12) \end{aligned}$$

$$\text{LnE} = 3.0767 - 0.2791 + 0.1653(2.06) + 0.3388(1.63)$$

$$\text{LnE} = 3.6909$$

$$E = \$40.08$$

Day Use Visitor Group Expenditures per Day

$$\begin{aligned} \text{LnE} &= 3.5638(0) + 2.7958(0) + 2.8436(0) + 3.0767(1) + 3.0267(0) \\ &\quad + 2.8453(0) + 3.0900(0) - 0.27913(0) + 0.1653\text{Ln}(5.67) + 0.3388\text{Ln}(3.89) \end{aligned}$$

$$\text{LnE} = 3.0767 + 0.1653(1.74) + 0.3388(1.36)$$

$$\text{LnE} = 3.8238$$

$$E = \$45.78$$

Boca Reservoir

Camping Visitor Group Expenditures per Day

$$\begin{aligned}\text{LnE} &= 3.5638(0) + 2.7958(0) + 2.8436(0) + 3.0767(0) + 3.0267(1) \\ &\quad + 2.8453(0) + 3.0900(0) - 0.2791(1) + 0.1653\text{Ln}(7.83) + 0.3388\text{Ln}(5.10)\end{aligned}$$

$$\text{LnE} = 3.0267 - 0.27913 + 0.1653(2.05) + 0.3388(1.63)$$

$$\text{LnE} = 3.6398$$

$$E = \$38.09$$

Day Use Visitor Group Expenditures per Day

$$\begin{aligned}\text{LnE} &= 3.5638(0) + 2.7958(0) + 2.8436(0) + 3.0767(0) + 3.0267(1) \\ &\quad + 2.8453(0) + 3.0900(0) - 0.2791(0) + 0.1653\text{Ln}(5.24) + 0.3388\text{Ln}(5.02)\end{aligned}$$

$$\text{LnE} = 3.0267 + 0.1653(1.66) + 0.3388(1.61)$$

$$\text{LnE} = 3.8472$$

$$E = \$46.86$$

Lower Truckee River

Camping Visitor Group Expenditures per Day

$$\begin{aligned}\text{LnE} &= 3.5638(0) + 2.7958(0) + 2.8436(0) + 3.0767(0) + 3.0267(0) \\ &\quad + 2.8453(1) + 3.0900(0) - 0.2791(1) + 0.1653\text{Ln}(3.00) + 0.3388\text{Ln}(2.00)\end{aligned}$$

$$\text{LnE} = 2.8453 - 0.2791 + 0.1653(1.10) + 0.3388(0.69)$$

$$\text{LnE} = 2.9827$$

$$E = \$19.74$$

Day Use Visitor Group Expenditures per Day

$$\begin{aligned}\text{LnE} &= 3.5638(0) + 2.7958(0) + 2.8436(0) + 3.0767(0) + 3.0267(0) \\ &\quad + 2.8453(1) + 3.0900(0) - 0.2791(0) + 0.1653\text{Ln}(3.96) + 0.3388\text{Ln}(2.29)\end{aligned}$$

$$\text{LnE} = 2.8453 + 0.1653(1.38) + 0.3388(0.83)$$

$$\text{LnE} = 3.3536$$

$$E = \$28.60$$

Pyramid Lake

Camping Visitor Group Expenditures per Day

$$\begin{aligned} \text{LnE} &= 3.5638(0) + 2.7958(0) + 2.8436(0) + 3.0767(0) + 3.0267(0) \\ &\quad + 2.8453(0) + 3.0900(1) - 0.2791(1) + 0.1653\text{Ln}(8.20) + 0.3388\text{Ln}(4.72) \end{aligned}$$

$$\text{LnE} = 3.0900 - 0.2791 + 0.1653(2.10) + 0.3388(1.55)$$

$$\text{LnE} = 3.6845$$

$$E = \$39.83$$

Day Use Visitor Group Expenditures per Day

$$\begin{aligned} \text{LnE} &= 3.5638(0) + 2.7958(0) + 2.8436(0) + 3.0767(0) + 3.0267(0) \\ &\quad + 2.8453(0) + 3.0900(1) - 0.2791(0) + 0.1653\text{Ln}(5.74) + 0.3388\text{Ln}(5.92) \end{aligned}$$

$$\text{LnE} = 3.0900 + 0.1653(1.75) + 0.3388(1.78)$$

$$\text{LnE} = 3.9815$$

$$E = \$53.60$$

The above camping and day use visitor expenditure function values are presented by site in Table 7.2-2.

Table 7.2-1. Camping and Day Use Visitor Expenditure Function Observations.

Observation Number	Year	Site	Questionnaire Number	Visitor Type	Expenditure	Number of Days	Expenditure per Day	Upper Truckee River UTR	Donner Lake DL	Promer Reservoir PR	Stampede Reservoir SR	Boon Reservoir BR	Lower Truckee River LTR	Pyramid Lake PL	Camping Visitor	Activity Hours	Group Size
1	1993	UTR	1	C	267.00	7.0	38.14	1	0	0	0	0	0	0	1	2.5	4.0
2	1993	UTR	2	C	240.00	10.0	24.00	1	0	0	0	0	0	0	1	4.0	4.0
3	1993	UTR	3	C	100.00	2.0	50.00	1	0	0	0	0	0	0	1	3.0	4.0
4	1993	UTR	4	C	290.00	2.0	145.00	1	0	0	0	0	0	0	1	6.0	4.0
5	1993	UTR	5	C	183.50	3.0	61.17	1	0	0	0	0	0	0	1	5.0	2.0
6	1993	UTR	6	C	83.00	7.0	11.86	1	0	0	0	0	0	0	1	8.0	2.0
7	1993	UTR	7	C	50.00	1.0	50.00	1	0	0	0	0	0	0	1	2.0	6.0
8	1993	UTR	8	C	71.00	1.0	71.00	1	0	0	0	0	0	0	1	7.0	4.0
9	1993	UTR	9	C	36.00	3.0	12.00	1	0	0	0	0	0	0	1	2.0	4.0
10	1993	UTR	10	C	198.00	5.0	39.60	1	0	0	0	0	0	0	1	8.0	2.0
11	1993	UTR	11	C	78.00	2.0	39.00	1	0	0	0	0	0	0	1	2.0	4.0
12	1993	UTR	12	C	223.00	4.0	55.75	1	0	0	0	0	0	0	1	11.0	6.0
13	1993	UTR	13	C	290.00	14.0	20.71	1	0	0	0	0	0	0	1	14.0	2.0
14	1993	UTR	14	C	75.00	1.0	75.00	1	0	0	0	0	0	0	1	4.0	2.0
15	1993	UTR	15	C	317.00	10.0	31.70	1	0	0	0	0	0	0	1	2.0	2.0
16	1993	UTR	1	DU	430.00	0.0	430.00	1	0	0	0	0	0	0	0	3.0	7.0
17	1993	UTR	2	DU	540.00	0.0	540.00	1	0	0	0	0	0	0	0	3.0	4.0
18	1993	PR	1	DU	37.90	0.0	37.90	0	0	1	0	0	0	0	0	6.0	2.0
19	1993	PR	2	DU	54.00	0.0	54.00	0	0	1	0	0	0	0	0	2.0	1.0
20	1993	PR	3	DU	732.00	0.0	732.00	0	0	1	0	0	0	0	0	4.0	8.0
21	1993	PR	4	DU	268.00	0.0	268.00	0	0	1	0	0	0	0	0	3.0	5.0
22	1993	PR	5	DU	24.50	0.0	24.50	0	0	1	0	0	0	0	0	3.0	2.0
23	1993	PR	6	DU	623.00	0.0	623.00	0	0	1	0	0	0	0	0	2.0	2.0
24	1993	SR	1	C	145.00	3.0	48.33	0	0	0	1	0	0	0	1	3.0	8.0
25	1993	SR	2	C	66.00	3.0	22.00	0	0	0	1	0	0	0	1	8.0	4.0
26	1993	SR	3	C	177.50	2.0	88.75	0	0	0	1	0	0	0	1	4.0	4.0
27	1993	SR	4	C	137.00	2.0	68.50	0	0	0	1	0	0	0	1	2.0	2.0
28	1993	SR	5	C	163.00	3.0	54.33	0	0	0	1	0	0	0	1	2.0	3.0
29	1993	SR	6	C	180.00	3.0	60.00	0	0	0	1	0	0	0	1	9.0	7.0
30	1993	SR	7	C	421.00	7.0	60.14	0	0	0	1	0	0	0	1	9.0	9.0
31	1993	SR	8	C	110.90	2.0	55.45	0	0	0	1	0	0	0	1	7.0	2.0
32	1993	SR	9	C	500.00	2.0	250.00	0	0	0	1	0	0	0	1	5.0	14.0
33	1993	SR	10	C	239.00	3.0	79.67	0	0	0	1	0	0	0	1	4.0	8.0
34	1993	SR	11	C	76.00	3.0	25.33	0	0	0	1	0	0	0	1	5.0	1.0
35	1993	SR	12	C	56.00	2.0	28.00	0	0	0	1	0	0	0	1	5.0	2.0
36	1993	SR	13	C	91.00	5.0	18.20	0	0	0	1	0	0	0	1	5.0	2.0
37	1993	SR	14	C	325.00	4.0	81.25	0	0	0	1	0	0	0	1	5.0	2.0
38	1993	SR	15	C	315.00	3.0	105.00	0	0	0	1	0	0	0	1	13.0	10.0
39	1993	SR	16	C	312.00	2.0	156.00	0	0	0	1	0	0	0	1	8.0	5.0
40	1993	SR	17	C	167.20	2.0	83.60	0	0	0	1	0	0	0	1	6.0	3.0
41	1993	SR	18	C	76.00	1.0	76.00	0	0	0	1	0	0	0	1	1.5	2.0
42	1993	SR	19	C	90.95	2.0	45.48	0	0	0	1	0	0	0	1	5.0	6.0
43	1993	SR	20	C	722.00	10.0	72.20	0	0	0	1	0	0	0	1	12.0	19.0
44	1993	SR	21	C	48.00	3.0	16.00	0	0	0	1	0	0	0	1	5.0	2.0
45	1993	SR	22	C	239.00	8.0	29.88	0	0	0	1	0	0	0	1	3.0	4.0
46	1993	SR	23	C	240.00	2.0	120.00	0	0	0	1	0	0	0	1	10.0	8.0
47	1993	SR	24	C	266.00	7.0	38.00	0	0	0	1	0	0	0	1	6.5	5.0
48	1993	SR	25	C	123.00	6.0	20.50	0	0	0	1	0	0	0	1	8.0	4.0
49	1993	SR	26	C	169.00	6.0	28.17	0	0	0	1	0	0	0	1	2.0	2.0
50	1993	SR	27	C	77.00	2.0	38.50	0	0	0	1	0	0	0	1	13.0	2.0
51	1993	SR	28	C	199.00	2.0	99.50	0	0	0	1	0	0	0	1	4.0	12.0
52	1993	SR	29	C	249.00	3.0	83.00	0	0	0	1	0	0	0	1	5.0	13.0
53	1993	SR	30	C	90.00	2.0	45.00	0	0	0	1	0	0	0	1	5.0	2.0
54	1993	SR	31	C	361.00	7.0	51.57	0	0	0	1	0	0	0	1	10.0	4.0
55	1993	SR	32	C	65.50	5.0	13.10	0	0	0	1	0	0	0	1	5.0	2.0
56	1993	SR	33	C	238.00	3.0	76.67	0	0	0	1	0	0	0	1	8.0	7.0
57	1993	SR	1	DU	43.00	0.0	43.00	0	0	0	1	0	0	0	0	3.0	4.0
58	1993	SR	2	DU	204.00	0.0	204.00	0	0	0	1	0	0	0	0	3.0	8.0
59	1993	SR	3	DU	15.00	0.0	15.00	0	0	0	1	0	0	0	0	4.0	4.0

Table 7.2-1. Camping and Day Use Visitor Expenditure Function Observations (continue).

Observation Number	Year	Site	Questionnaire Number	Visitor Type	Expenditures	Number of Days	Expenditures per Day	Upper Truckee River UTR	Donner Lake DL	Promer Reservoir PR	Statopede Reservoir SR	Boas Reservoir BR	Lower Truckee River LTR	Pyramid Lake PL	Camping Visitor	Activity Hours	Group Size
60	1993	SR	4	DU	271.00	0.0	271.00	0	0	0	1	0	0	0	0	8.0	2.0
61	1993	SR	5	DU	158.00	0.0	158.00	0	0	0	1	0	0	0	0	5.0	2.0
62	1993	SR	6	DU	137.00	0.0	137.00	0	0	0	1	0	0	0	0	5.0	2.0
63	1993	SR	7	DU	60.00	0.0	60.00	0	0	0	1	0	0	0	0	10.0	4.0
64	1993	SR	8	DU	35.00	0.0	35.00	0	0	0	1	0	0	0	0	8.0	2.0
65	1993	SR	9	DU	150.00	0.0	150.00	0	0	0	1	0	0	0	0	3.0	7.0
66	1993	BR	1	CP	63.00	2.0	31.50	0	0	0	0	1	0	0	1	7.0	4.0
67	1993	BR	2	CP	175.00	10.0	17.50	0	0	0	0	1	0	0	1	3.0	2.0
68	1993	BR	3	CP	124.00	2.0	62.00	0	0	0	0	1	0	0	1	7.0	4.0
69	1993	BR	4	CP	100.00	14.0	7.14	0	0	0	0	1	0	0	1	4.0	4.0
70	1993	BR	1	DU	30.00	0.0	30.00	0	0	0	0	1	0	0	0	5.0	5.0
71	1993	BR	2	DU	60.00	0.0	60.00	0	0	0	0	1	0	0	0	6.0	9.0
72	1993	BR	3	DU	70.00	0.0	70.00	0	0	0	0	1	0	0	0	8.0	4.0
73	1993	BR	4	DU	30.00	0.0	30.00	0	0	0	0	1	0	0	0	4.0	2.0
74	1993	BR	5	DU	465.00	0.0	465.00	0	0	0	0	1	0	0	0	6.0	2.0
75	1993	BR	6	DU	110.00	0.0	110.00	0	0	0	0	1	0	0	0	2.0	18.0
76	1993	BR	7	DU	73.00	0.0	73.00	0	0	0	0	1	0	0	0	5.0	3.0
77	1993	BR	8	DU	30.00	0.0	30.00	0	0	0	0	1	0	0	0	2.0	2.0
78	1993	BR	9	DU	130.00	0.0	130.00	0	0	0	0	1	0	0	0	8.0	4.0
79	1993	BR	10	DU	10.00	0.0	10.00	0	0	0	0	1	0	0	0	6.0	18.0
80	1993	BR	11	DU	12.00	0.0	12.00	0	0	0	0	1	0	0	0	5.0	2.0
81	1993	BR	12	DU	12.00	0.0	12.00	0	0	0	0	1	0	0	0	5.0	4.0
82	1993	BR	13	DU	10.00	0.0	10.00	0	0	0	0	1	0	0	0	4.0	1.0
83	1993	BR	14	DU	46.50	0.0	46.50	0	0	0	0	1	0	0	0	5.0	2.0
84	1993	BR	15	DU	129.00	0.0	129.00	0	0	0	0	1	0	0	0	6.0	3.0
85	1993	BR	16	DU	41.00	0.0	41.00	0	0	0	0	1	0	0	0	8.0	3.0
86	1993	BR	17	DU	20.00	0.0	20.00	0	0	0	0	1	0	0	0	2.0	3.0
87	1993	BR	18	DU	32.00	0.0	32.00	0	0	0	0	1	0	0	0	3.0	6.0
88	1993	BR	19	DU	70.00	0.0	70.00	0	0	0	0	1	0	0	0	6.0	7.0
89	1993	BR	20	DU	25.00	0.0	25.00	0	0	0	0	1	0	0	0	3.0	6.0
90	1993	BR	21	DU	1910.00	0.0	1910.00	0	0	0	0	1	0	0	0	8.0	3.0
91	1993	BR	22	DU	42.50	0.0	42.50	0	0	0	0	1	0	0	0	5.0	2.0
92	1993	BR	23	DU	220.00	0.0	220.00	0	0	0	0	1	0	0	0	2.0	10.0
93	1993	BR	24	DU	42.00	0.0	42.00	0	0	0	0	1	0	0	0	8.0	4.0
94	1993	BR	25	DU	25.00	0.0	25.00	0	0	0	0	1	0	0	0	4.0	3.0
95	1993	BR	26	DU	10.00	0.0	10.00	0	0	0	0	1	0	0	0	2.0	2.0
96	1993	BR	27	DU	20.00	0.0	20.00	0	0	0	0	1	0	0	0	5.0	1.0
97	1993	BR	28	DU	60.00	0.0	60.00	0	0	0	0	1	0	0	0	5.0	4.0
98	1993	BR	29	DU	40.00	0.0	40.00	0	0	0	0	1	0	0	0	6.0	8.0
99	1993	BR	30	DU	30.00	0.0	30.00	0	0	0	0	1	0	0	0	4.0	7.0
100	1993	BR	31	DU	223.00	0.0	223.00	0	0	0	0	1	0	0	0	9.0	1.0
101	1993	BR	32	DU	150.00	0.0	150.00	0	0	0	0	1	0	0	0	6.0	7.0
102	1993	BR	33	DU	10.00	0.0	10.00	0	0	0	0	1	0	0	0	3.0	3.0
103	1993	BR	34	DU	10.00	0.0	10.00	0	0	0	0	1	0	0	0	4.0	1.0
104	1993	BR	35	DU	24.00	0.0	24.00	0	0	0	0	1	0	0	0	5.0	3.0
105	1993	BR	36	DU	37.00	0.0	37.00	0	0	0	0	1	0	0	0	6.0	10.0
106	1993	BR	37	DU	0.50	0.0	0.50	0	0	0	0	1	0	0	0	1.0	2.0
107	1993	BR	38	DU	280.00	0.0	280.00	0	0	0	0	1	0	0	0	12.0	5.0
108	1993	BR	39	DU	90.00	0.0	90.00	0	0	0	0	1	0	0	0	5.0	2.0
109	1993	BR	40	DU	300.00	0.0	300.00	0	0	0	0	1	0	0	0	4.0	3.0
110	1993	LTR	1	CP	35.00	2.0	17.50	0	0	0	0	0	1	0	0	3.0	2.0
111	1993	LTR	1	DU	1.00	0.0	1.00	0	0	0	0	0	1	0	1	4.0	1.0
112	1993	LTR	2	DU	94.00	0.0	94.00	0	0	0	0	0	1	0	0	4.0	5.0
113	1993	LTR	3	DU	151.00	0.0	151.00	0	0	0	0	0	1	0	0	7.0	2.0
114	1993	LTR	4	DU	23.00	0.0	23.00	0	0	0	0	0	1	0	0	4.0	1.0
115	1993	LTR	5	DU	1.00	0.0	1.00	0	0	0	0	0	1	0	0	7.0	2.0
116	1993	LTR	6	DU	45.00	0.0	45.00	0	0	0	0	0	1	0	0	4.0	4.0
117	1993	LTR	7	DU	13.50	0.0	13.50	0	0	0	0	0	1	0	0	5.0	1.0
118	1993	LTR	8	DU	20.00	0.0	20.00	0	0	0	0	0	1	0	0	3.0	2.0

Table 7.2-1. Camping and Day Use Visitor Expenditure Function Observations (continue).

Observation Number	Year	Site	Questionnaire Number	Visitor Type	Expenditures	Number of Days	Expenditures per Day	Upper Truckee River UTR	Donner Lake DL	Promer Reservoir PR	Stampede Reservoir SR	Beck Reservoir BR	Lower Truckee River LTR	Pyramid Lake PL	Camping Visitor	Activity Hours	Group Size
119	1993	LTR	9	DU	21.00	0.0	21.00	0	0	0	0	0	1	0	0	4.0	1.0
120	1993	LTR	10	DU	34.00	0.0	34.00	0	0	0	0	0	1	0	0	2.0	4.0
121	1993	LTR	11	DU	775.00	0.0	775.00	0	0	0	0	0	1	0	0	1.0	1.0
122	1993	LTR	12	DU	44.00	0.0	44.00	0	0	0	0	0	1	0	0	3.0	1.0
123	1993	LTR	13	DU	52.00	0.0	52.00	0	0	0	0	0	1	0	0	3.0	1.0
124	1993	LTR	14	DU	0.50	0.0	0.50	0	0	0	0	0	1	0	0	2.0	1.0
125	1993	LTR	15	DU	70.00	0.0	70.00	0	0	0	0	0	1	0	0	3.0	1.0
126	1993	LTR	16	DU	21.50	0.0	21.50	0	0	0	0	0	1	0	0	4.0	1.0
127	1993	LTR	17	DU	28.50	0.0	28.50	0	0	0	0	0	1	0	0	2.0	5.0
128	1993	LTR	18	DU	182.00	0.0	182.00	0	0	0	0	0	1	0	0	6.0	10.0
129	1993	LTR	19	DU	22.00	0.0	22.00	0	0	0	0	0	1	0	0	3.0	2.0
130	1993	LTR	20	DU	14.00	0.0	14.00	0	0	0	0	0	1	0	0	4.0	2.0
131	1993	LTR	21	DU	21.50	0.0	21.50	0	0	0	0	0	1	0	0	6.0	1.0
132	1993	LTR	22	DU	73.00	0.0	73.00	0	0	0	0	0	1	0	0	3.0	2.0
133	1993	LTR	23	DU	23.00	0.0	23.00	0	0	0	0	0	1	0	0	5.0	2.0
134	1993	LTR	24	DU	42.00	0.0	42.00	0	0	0	0	0	1	0	0	6.0	2.0
135	1993	PL	1	CP	320.00	4.0	80.00	0	0	0	0	0	1	1	1	1.0	2.0
136	1993	PL	2	CP	75.00	3.0	25.00	0	0	0	0	0	1	1	1	7.0	5.0
137	1993	PL	3	CP	170.00	2.0	85.00	0	0	0	0	0	1	1	1	7.0	2.0
138	1993	PL	4	CP	41.00	1.0	41.00	0	0	0	0	0	1	1	1	4.0	2.0
139	1993	PL	5	CP	87.00	1.0	87.00	0	0	0	0	0	1	1	1	12.0	2.0
140	1993	PL	6	CP	162.00	4.0	40.50	0	0	0	0	0	1	1	1	10.0	3.0
141	1993	PL	7	CP	140.00	2.0	70.00	0	0	0	0	0	1	1	1	6.0	5.0
142	1993	PL	8	CP	75.00	3.0	25.00	0	0	0	0	0	1	1	1	8.0	1.0
143	1993	PL	9	CP	195.00	6.0	32.50	0	0	0	0	0	1	1	1	3.0	4.0
144	1993	PL	10	CP	180.00	4.0	45.00	0	0	0	0	0	1	1	1	1.0	6.0
145	1993	PL	1	DU	70.00	0.0	70.00	0	0	0	0	0	1	0	0	5.0	2.0
146	1993	PL	2	DU	20.00	0.0	20.00	0	0	0	0	0	1	0	0	7.0	3.0
147	1993	PL	3	DU	61.00	0.0	61.00	0	0	0	0	0	1	0	0	8.0	5.0
148	1993	PL	4	DU	45.00	0.0	45.00	0	0	0	0	0	1	0	0	5.0	3.0
149	1993	PL	5	DU	45.00	0.0	45.00	0	0	0	0	0	1	0	0	7.0	10.0
150	1993	PL	6	DU	42.00	0.0	42.00	0	0	0	0	0	1	0	0	5.0	5.0
151	1993	PL	7	DU	220.00	0.0	220.00	0	0	0	0	0	1	0	0	6.0	7.0
152	1994	DL	1	CP	68.00	4.0	17.00	0	1	0	0	0	0	0	1	4.0	4.0
153	1994	DL	2	CP	343.00	5.0	68.60	0	1	0	0	0	0	0	1	9.0	6.0
154	1994	DL	3	CP	108.00	3.0	36.00	0	1	0	0	0	0	0	1	6.0	2.0
155	1994	DL	4	CP	335.00	6.0	55.83	0	1	0	0	0	0	0	1	8.0	2.0
156	1994	DL	5	CP	210.00	3.0	70.00	0	1	0	0	0	0	0	1	12.0	4.0
157	1994	DL	6	CP	56.25	2.0	28.13	0	1	0	0	0	0	0	1	12.0	9.0
158	1994	DL	7	CP	160.00	5.0	32.00	0	1	0	0	0	0	0	1	10.0	6.0
159	1994	DL	8	CP	135.00	2.0	67.50	0	1	0	0	0	0	0	1	12.0	2.0
160	1994	DL	9	CP	163.00	1.0	163.00	0	1	0	0	0	0	0	1	6.0	2.0
161	1994	DL	10	CP	48.00	2.0	24.00	0	1	0	0	0	0	0	1	5.0	2.0
162	1994	DL	11	CP	181.00	4.0	45.25	0	1	0	0	0	0	0	1	5.0	14.0
163	1994	DL	12	CP	490.60	4.0	122.65	0	1	0	0	0	0	0	1	10.0	3.0
164	1994	DL	13	CP	980.00	8.0	122.50	0	1	0	0	0	0	0	1	7.0	8.0
165	1994	DL	14	CP	111.00	5.0	22.20	0	1	0	0	0	0	0	1	7.0	2.0
166	1994	DL	15	CP	385.00	8.0	48.13	0	1	0	0	0	0	0	1	11.0	7.0
167	1994	DL	16	CP	10.00	6.0	1.67	0	1	0	0	0	0	0	1	6.0	7.0
168	1994	DL	17	CP	130.00	2.0	65.00	0	1	0	0	0	0	0	1	8.0	3.0
169	1994	DL	18	CP	68.00	2.0	34.00	0	1	0	0	0	0	0	1	10.0	10.0
170	1994	DL	19	CP	150.00	3.0	50.00	0	1	0	0	0	0	0	1	11.0	2.0
171	1994	DL	20	CP	87.00	2.0	43.50	0	1	0	0	0	0	0	1	3.0	2.0
172	1994	DL	21	CP	162.00	2.0	81.00	0	1	0	0	0	0	0	1	10.0	9.0
173	1994	DL	22	CP	165.00	4.0	41.25	0	1	0	0	0	0	0	1	8.0	4.0
174	1994	DL	23	CP	200.00	3.0	66.67	0	1	0	0	0	0	0	1	11.0	7.0
175	1994	DL	24	CP	271.25	6.0	45.21	0	1	0	0	0	0	0	1	10.0	7.0
176	1994	DL	25	CP	47.00	3.0	15.67	0	1	0	0	0	0	0	1	12.0	10.0
177	1994	DL	26	CP	190.00	2.0	95.00	0	1	0	0	0	0	0	1	12.0	7.0

Table 7.2-1. Camping and Day Use Visitor Expenditure Function Observations (continue).

Observation Number	Year	Site	Questionnaire Number	Visitor Type	Expenditure	Number of Days	Expenditure per Day	Upper Truckee River UTR	Donner Lake DL	Promer Reservoir PR	Stampede Reservoir SR	Boon Reservoir BR	Lower Truckee River LTR	Pyramid Lake PL	Camping Visitor	Activity Hours	Group Size
178	1994	DL	27	CP	121.25	2.0	60.63	0	1	0	0	0	0	0	1	7.0	14.0
179	1994	DL	28	CP	354.00	7.0	50.57	0	1	0	0	0	0	0	1	2.0	2.0
180	1994	DL	29	CP	51.00	2.5	20.40	0	1	0	0	0	0	0	1	9.0	6.0
181	1994	DL	30	CP	140.00	2.0	70.00	0	1	0	0	0	0	0	1	12.0	2.0
182	1994	DL	31	CP	144.25	2.0	72.13	0	1	0	0	0	0	0	1	12.0	1.0
183	1994	DL	32	CP	830.00	7.0	118.57	0	1	0	0	0	0	0	1	8.0	8.0
184	1994	DL	33	CP	64.75	2.0	32.38	0	1	0	0	0	0	0	1	12.0	4.0
185	1994	DL	34	CP	38.00	2.0	19.00	0	1	0	0	0	0	0	1	5.0	4.0
186	1994	DL	35	CP	25.00	2.0	12.50	0	1	0	0	0	0	0	1	7.0	6.0
187	1994	DL	36	CP	14.00	5.0	2.80	0	1	0	0	0	0	0	1	8.0	3.0
188	1994	DL	37	CP	30.00	3.0	10.00	0	1	0	0	0	0	0	1	1.0	2.0
189	1994	DL	38	CP	121.00	4.0	30.25	0	1	0	0	0	0	0	1	5.0	8.0
190	1994	DL	39	CP	73.00	3.0	24.33	0	1	0	0	0	0	0	1	6.0	6.0
191	1994	DL	40	CP	110.50	5.0	22.10	0	1	0	0	0	0	0	1	10.0	4.0
192	1994	DL	41	CP	140.00	3.0	46.67	0	1	0	0	0	0	0	1	7.0	7.0
193	1994	DL	42	CP	74.00	4.0	18.50	0	1	0	0	0	0	0	1	12.0	2.0
194	1994	DL	1	DU	25.00	0.0	25.00	0	1	0	0	0	0	0	0	3.0	2.0
195	1994	DL	2	DU	63.00	0.0	63.00	0	1	0	0	0	0	0	0	4.0	4.0
196	1994	DL	3	DU	19.00	0.0	19.00	0	1	0	0	0	0	0	0	4.0	3.0
197	1994	DL	4	DU	53.00	0.0	53.00	0	1	0	0	0	0	0	0	2.0	4.0
198	1994	DL	5	DU	34.00	0.0	34.00	0	1	0	0	0	0	0	0	5.0	6.0
199	1994	DL	6	DU	95.00	0.0	95.00	0	1	0	0	0	0	0	0	6.0	11.0
200	1994	DL	7	DU	27.00	0.0	27.00	0	1	0	0	0	0	0	0	3.0	10.0
201	1994	DL	8	DU	3.00	0.0	3.00	0	1	0	0	0	0	0	0	4.0	4.0
202	1994	DL	9	DU	5.00	0.0	5.00	0	1	0	0	0	0	0	0	6.0	3.0
203	1994	DL	10	DU	7.00	0.0	7.00	0	1	0	0	0	0	0	0	10.0	4.0
204	1994	DL	11	DU	60.50	0.0	60.50	0	1	0	0	0	0	0	0	9.0	7.0
205	1994	DL	12	DU	125.00	0.0	125.00	0	1	0	0	0	0	0	0	7.0	5.0
206	1994	DL	13	DU	22.50	0.0	22.50	0	1	0	0	0	0	0	0	3.0	6.0
207	1994	DL	14	DU	85.00	0.0	85.00	0	1	0	0	0	0	0	0	3.5	5.0
208	1994	DL	15	DU	43.00	0.0	43.00	0	1	0	0	0	0	0	0	4.0	4.0
209	1994	DL	16	DU	20.00	0.0	20.00	0	1	0	0	0	0	0	0	1.5	2.0
210	1994	DL	17	DU	140.00	0.0	140.00	0	1	0	0	0	0	0	0	6.0	9.0
211	1994	DL	18	DU	25.00	0.0	25.00	0	1	0	0	0	0	0	0	10.0	2.0
212	1994	DL	19	DU	35.00	0.0	35.00	0	1	0	0	0	0	0	0	5.0	2.0
213	1994	DL	20	DU	5.00	0.0	5.00	0	1	0	0	0	0	0	0	7.0	16.0
214	1994	DL	21	DU	60.00	0.0	60.00	0	1	0	0	0	0	0	0	8.0	7.0
215	1994	DL	22	DU	11.00	0.0	11.00	0	1	0	0	0	0	0	0	4.0	9.0
216	1994	DL	23	DU	31.00	0.0	31.00	0	1	0	0	0	0	0	0	3.0	6.0
217	1994	DL	24	DU	10.00	0.0	10.00	0	1	0	0	0	0	0	0	4.0	9.0
218	1994	DL	25	DU	81.65	0.0	81.65	0	1	0	0	0	0	0	0	2.5	4.0
219	1994	DL	26	DU	5.00	0.0	5.00	0	1	0	0	0	0	0	0	8.0	4.0
220	1994	DL	27	DU	177.99	0.0	177.99	0	1	0	0	0	0	0	0	8.0	8.0
221	1994	DL	28	DU	46.00	0.0	46.00	0	1	0	0	0	0	0	0	6.0	5.0
222	1994	DL	29	DU	149.51	0.0	149.51	0	1	0	0	0	0	0	0	3.0	5.0
223	1994	DL	30	DU	12.00	0.0	12.00	0	1	0	0	0	0	0	0	3.0	2.0
224	1994	DL	31	DU	156.06	0.0	156.06	0	1	0	0	0	0	0	0	4.0	8.0
225	1994	DL	32	DU	92.50	0.0	92.50	0	1	0	0	0	0	0	0	2.0	1.0
226	1994	DL	33	DU	21.00	0.0	21.00	0	1	0	0	0	0	0	0	6.0	4.0
227	1994	DL	34	DU	5.00	0.0	5.00	0	1	0	0	0	0	0	0	5.0	2.0
228	1994	DL	35	DU	50.00	0.0	50.00	0	1	0	0	0	0	0	0	5.0	3.0
229	1994	DL	36	DU	11.00	0.0	11.00	0	1	0	0	0	0	0	0	4.0	2.0
230	1994	DL	37	DU	15.00	0.0	15.00	0	1	0	0	0	0	0	0	8.0	2.0
231	1994	DL	38	DU	4.50	0.0	4.50	0	1	0	0	0	0	0	0	3.0	1.0
232	1994	DL	39	DU	137.00	0.0	137.00	0	1	0	0	0	0	0	0	2.0	4.0
233	1994	DL	40	DU	2.00	0.0	2.00	0	1	0	0	0	0	0	0	6.0	7.0
234	1994	DL	41	DU	5.00	0.0	5.00	0	1	0	0	0	0	0	0	2.0	2.0
235	1994	PR	1	CP	177.70	4.0	44.43	0	0	1	0	0	0	0	1	9.0	2.0
236	1994	PR	2	CP	10.00	3.0	3.33	0	0	1	0	0	0	0	1	2.0	2.0

Table 7.2-1. Camping and Day Use Visitor Expenditure Function Observations (continue).

Observation Number	Year	Site	Questionnaire Number	Visitor Type	Expenditures	Number of Days	Expenditures per Day	Upper Truckee River UTR	Donner Lake DL	Fronser Reservoir FR	Stampede Reservoir SR	Boon Reservoir BR	Lower Truckee River LTR	Pyramid Lake PL	Camping Visitor	Activity Hours	Group Size
237	1994	FR	3	CP	193.00	2.0	96.50	0	0	1	0	0	0	0	1	10.0	9.0
238	1994	FR	4	CP	114.00	14.0	8.14	0	0	1	0	0	0	0	1	12.0	3.0
239	1994	FR	5	CP	125.00	7.0	17.86	0	0	1	0	0	0	0	1	1.0	2.0
240	1994	FR	6	CP	185.00	2.0	92.50	0	0	1	0	0	0	0	1	7.0	3.0
241	1994	FR	7	CP	245.00	3.0	81.67	0	0	1	0	0	0	0	1	4.0	7.0
242	1994	FR	8	CP	6.00	1.0	6.00	0	0	1	0	0	0	0	1	5.0	6.0
243	1994	FR	9	CP	279.00	3.0	93.00	0	0	1	0	0	0	0	1	3.0	1.0
244	1994	FR	10	CP	8.00	2.0	4.00	0	0	1	0	0	0	0	1	12.0	2.0
245	1994	FR	11	CP	8.00	3.0	2.67	0	0	1	0	0	0	0	1	9.0	4.0
246	1994	FR	12	CP	31.00	4.0	7.75	0	0	1	0	0	0	0	1	6.0	2.0
247	1994	FR	13	CP	63.00	1.0	63.00	0	0	1	0	0	0	0	1	6.0	2.0
248	1994	FR	14	CP	87.50	4.0	21.88	0	0	1	0	0	0	0	1	8.0	1.0
249	1994	FR	15	CP	522.00	4.0	130.50	0	0	1	0	0	0	0	1	12.0	2.0
250	1994	FR	16	CP	64.00	9.0	7.11	0	0	1	0	0	0	0	1	12.0	6.0
251	1994	FR	17	CP	244.00	3.0	81.33	0	0	1	0	0	0	0	1	10.0	8.0
252	1994	FR	18	CP	76.00	2.0	38.00	0	0	1	0	0	0	0	1	8.0	2.0
253	1994	FR	19	CP	16.00	2.0	8.00	0	0	1	0	0	0	0	1	12.0	3.0
254	1994	FR	20	CP	120.00	7.0	17.14	0	0	1	0	0	0	0	1	12.0	1.0
255	1994	FR	21	CP	426.00	12.0	35.50	0	0	1	0	0	0	0	1	8.0	4.0
256	1994	FR	22	CP	30.00	5.0	6.00	0	0	1	0	0	0	0	1	8.0	4.0
257	1994	FR	23	CP	24.00	2.0	12.00	0	0	1	0	0	0	0	1	7.0	8.0
258	1994	FR	24	CP	96.00	3.0	32.00	0	0	1	0	0	0	0	1	9.0	7.0
259	1994	FR	25	CP	59.25	4.0	14.81	0	0	1	0	0	0	0	1	5.0	5.0
260	1994	FR	26	CP	24.00	2.0	12.00	0	0	1	0	0	0	0	1	2.0	4.0
261	1994	FR	27	CP	136.00	2.0	68.00	0	0	1	0	0	0	0	1	5.0	2.0
262	1994	FR	28	CP	16.00	2.0	8.00	0	0	1	0	0	0	0	1	10.0	5.0
263	1994	FR	29	CP	74.00	3.0	24.67	0	0	1	0	0	0	0	1	10.0	2.0
264	1994	FR	30	CP	66.00	2.0	33.00	0	0	1	0	0	0	0	1	4.0	3.0
265	1994	FR	1	DU	1.00	0.0	1.00	0	0	1	0	0	0	0	0	4.0	1.0
266	1994	FR	2	DU	80.00	0.0	80.00	0	0	1	0	0	0	0	0	3.0	4.0
267	1994	SR	1	CP	11.00	2.0	5.50	0	0	0	1	0	0	0	1	11.0	2.0
268	1994	SR	2	CP	252.00	3.0	77.33	0	0	0	1	0	0	0	1	8.5	2.0
269	1994	SR	3	CP	11.00	1.0	11.00	0	0	0	1	0	0	0	1	8.0	2.0
270	1994	SR	4	CP	72.00	4.0	18.00	0	0	0	1	0	0	0	1	9.0	2.0
271	1994	SR	5	CP	22.88	2.0	11.44	0	0	0	1	0	0	0	1	6.0	2.0
272	1994	SR	6	CP	300.00	3.0	100.00	0	0	0	1	0	0	0	1	10.0	4.0
273	1994	SR	7	CP	242.00	2.0	121.00	0	0	0	1	0	0	0	1	8.0	5.0
274	1994	SR	8	CP	237.00	7.0	33.86	0	0	0	1	0	0	0	1	8.0	2.0
275	1994	SR	9	CP	11.00	1.0	11.00	0	0	0	1	0	0	0	1	10.0	3.0
276	1994	SR	10	CP	16.00	4.0	4.00	0	0	0	1	0	0	0	1	4.0	6.0
277	1994	SR	11	CP	227.00	14.0	16.21	0	0	0	1	0	0	0	1	5.0	2.0
278	1994	SR	12	CP	135.00	4.0	33.75	0	0	0	1	0	0	0	1	4.0	4.0
279	1994	SR	13	CP	40.00	4.0	10.00	0	0	0	1	0	0	0	1	10.0	6.0
280	1994	SR	14	CP	43.00	6.0	7.17	0	0	0	1	0	0	0	1	7.0	4.0
281	1994	SR	15	CP	16.50	3.0	5.50	0	0	0	1	0	0	0	1	7.0	3.0
282	1994	SR	16	CP	95.00	5.0	19.00	0	0	0	1	0	0	0	1	5.0	2.0
283	1994	SR	17	CP	132.00	2.0	66.00	0	0	0	1	0	0	0	1	12.0	8.0
284	1994	SR	18	CP	142.50	8.0	17.81	0	0	0	1	0	0	0	1	8.0	3.0
285	1994	SR	19	CP	3108.00	14.0	222.00	0	0	0	1	0	0	0	1	4.0	4.0
286	1994	SR	20	CP	165.00	5.0	33.00	0	0	0	1	0	0	0	1	8.0	16.0
287	1994	SR	21	CP	170.00	3.0	56.67	0	0	0	1	0	0	0	1	12.0	4.0
288	1994	SR	22	CP	44.00	5.0	8.80	0	0	0	1	0	0	0	1	7.0	2.0
289	1994	SR	23	CP	322.00	14.0	23.00	0	0	0	1	0	0	0	1	8.0	2.0
290	1994	SR	24	CP	48.00	3.0	16.00	0	0	0	1	0	0	0	1	9.0	4.0
291	1994	SR	25	CP	149.00	4.0	37.25	0	0	0	1	0	0	0	1	9.0	2.0
292	1994	SR	26	CP	142.00	2.0	71.00	0	0	0	1	0	0	0	1	11.0	3.0
293	1994	SR	27	CP	190.00	3.0	63.33	0	0	0	1	0	0	0	1	10.0	4.0
294	1994	SR	28	CP	152.00	3.0	50.67	0	0	0	1	0	0	0	1	12.0	8.0
295	1994	SR	29	CP	92.00	2.0	46.00	0	0	0	1	0	0	0	1	7.0	2.0

Table 7.2-1. Camping and Day Use Visitor Expenditure Function Observations (continue).

Observation Number	Year	Site	Questionnaire Number	Visitor Type	Expenditure	Number of Days	Expenditure per Day	Upper Truckee River UTR	Donner Lake DL	Prosser Reservoir PR	Sagehen Reservoir SR	Boon Reservoir BR	Lower Truckee River LTR	Pyramid Lake PL	Camping Visitor	Activity Hours	Group Size
296	1994	SR	30	CP	163.00	4.0	40.75	0	0	0	1	0	0	0	1	7.0	6.0
297	1994	SR	31	CP	78.00	6.0	13.00	0	0	0	1	0	0	0	1	8.0	2.0
298	1994	SR	32	CP	106.50	4.0	26.63	0	0	0	1	0	0	0	1	10.0	4.0
299	1994	SR	33	CP	30.00	2.0	15.00	0	0	0	1	0	0	0	1	8.0	3.0
300	1994	SR	34	CP	22.00	4.0	5.50	0	0	0	1	0	0	0	1	8.0	2.0
301	1994	SR	35	CP	68.00	2.0	34.00	0	0	0	1	0	0	0	1	11.0	4.0
302	1994	SR	36	CP	153.00	4.0	38.25	0	0	0	1	0	0	0	1	12.0	20.0
303	1994	SR	37	CP	11.00	1.0	11.00	0	0	0	1	0	0	0	1	2.0	2.0
304	1994	SR	38	CP	19.00	2.0	9.50	0	0	0	1	0	0	0	1	8.0	3.0
305	1994	SR	39	CP	481.00	20.0	24.05	0	0	0	1	0	0	0	1	7.0	3.0
306	1994	SR	40	CP	330.00	4.0	82.50	0	0	0	1	0	0	0	1	12.0	9.0
307	1994	SR	41	CP	206.00	2.0	103.00	0	0	0	1	0	0	0	1	12.0	6.0
308	1994	SR	42	CP	72.00	2.0	36.00	0	0	0	1	0	0	0	1	12.0	7.0
309	1994	SR	43	CP	163.00	8.0	20.38	0	0	0	1	0	0	0	1	5.0	2.0
310	1994	SR	44	CP	253.00	3.0	84.33	0	0	0	1	0	0	0	1	8.0	4.0
311	1994	SR	45	CP	183.00	3.0	61.00	0	0	0	1	0	0	0	1	12.0	2.0
312	1994	SR	46	CP	57.00	3.0	19.00	0	0	0	1	0	0	0	1	7.0	2.0
313	1994	SR	47	CP	78.50	7.0	11.21	0	0	0	1	0	0	0	1	6.0	2.0
314	1994	SR	48	CP	33.00	4.0	8.25	0	0	0	1	0	0	0	1	7.0	9.0
315	1994	SR	49	CP	103.00	3.0	34.33	0	0	0	1	0	0	0	1	12.0	4.0
316	1994	SR	50	CP	267.50	4.0	66.88	0	0	0	1	0	0	0	1	8.0	4.0
317	1994	SR	51	CP	180.00	6.0	30.00	0	0	0	1	0	0	0	1	8.0	11.0
318	1994	SR	52	CP	47.00	2.0	23.50	0	0	0	1	0	0	0	1	5.0	2.0
319	1994	SR	53	CP	88.00	3.0	29.33	0	0	0	1	0	0	0	1	11.0	4.0
320	1994	SR	54	CP	242.80	8.0	30.25	0	0	0	1	0	0	0	1	12.0	2.0
321	1994	SR	55	CP	114.00	2.0	57.00	0	0	0	1	0	0	0	1	10.0	2.0
322	1994	SR	56	CP	483.00	10.0	48.30	0	0	0	1	0	0	0	1	11.0	2.0
323	1994	SR	57	CP	64.00	2.0	32.00	0	0	0	1	0	0	0	1	12.0	4.0
324	1994	SR	58	CP	226.50	4.0	56.63	0	0	0	1	0	0	0	1	12.0	22.0
325	1994	SR	59	CP	134.00	3.0	44.67	0	0	0	1	0	0	0	1	12.0	4.0
326	1994	SR	60	CP	142.50	4.0	35.63	0	0	0	1	0	0	0	1	12.0	3.0
327	1994	SR	61	CP	440.00	3.0	146.67	0	0	0	1	0	0	0	1	12.0	25.0
328	1994	SR	62	CP	343.50	7.0	49.07	0	0	0	1	0	0	0	1	7.0	2.0
329	1994	SR	63	CP	3.50	2.0	1.75	0	0	0	1	0	0	0	1	4.0	10.0
330	1994	SR	64	CP	98.00	3.0	32.67	0	0	0	1	0	0	0	1	8.0	5.0
331	1994	BR	1	CP	960.00	7.0	137.14	0	0	0	0	1	0	0	1	12.0	10.0
332	1994	BR	2	CP	250.00	1.0	250.00	0	0	0	0	1	0	0	1	12.0	2.0
333	1994	BR	3	CP	237.00	2.0	118.50	0	0	0	0	1	0	0	1	10.0	6.0
334	1994	BR	4	CP	6.00	2.0	3.00	0	0	0	0	1	0	0	1	11.9	3.0
335	1994	BR	5	CP	89.00	3.0	29.67	0	0	0	0	1	0	0	1	5.5	3.0
336	1994	BR	6	CP	66.00	2.0	33.00	0	0	0	0	1	0	0	1	7.0	3.0
337	1994	BR	7	CP	66.00	1.0	66.00	0	0	0	0	1	0	0	1	4.0	20.0
338	1994	BR	8	CP	12.00	2.0	6.00	0	0	0	0	1	0	0	1	9.0	4.0
339	1994	BR	9	CP	86.00	2.0	43.00	0	0	0	0	1	0	0	1	12.0	3.0
340	1994	BR	10	CP	58.00	3.0	19.33	0	0	0	0	1	0	0	1	5.0	1.0
341	1994	BR	11	CP	122.00	1.0	122.00	0	0	0	0	1	0	0	1	8.0	4.0
342	1994	BR	12	CP	206.00	14.0	14.71	0	0	0	0	1	0	0	1	8.0	9.0
343	1994	BR	13	CP	52.00	1.0	52.00	0	0	0	0	1	0	0	1	4.0	2.0
344	1994	BR	14	CP	287.00	14.0	14.79	0	0	0	0	1	0	0	1	1.0	3.0
345	1994	BR	15	CP	458.00	2.0	229.00	0	0	0	0	1	0	0	1	12.0	2.0
346	1994	BR	16	CP	353.00	2.0	176.50	0	0	0	0	1	0	0	1	12.0	14.0
347	1994	BR	17	CP	12.00	3.0	4.00	0	0	0	0	1	0	0	1	10.0	4.0
348	1994	BR	1	DU	10.00	0.0	10.00	0	0	0	0	1	0	0	0	3.0	3.0
349	1994	BR	2	DU	15.00	0.0	15.00	0	0	0	0	1	0	0	0	5.0	2.0
350	1994	BR	3	DU	100.00	0.0	100.00	0	0	0	0	1	0	0	0	8.0	25.0
351	1994	BR	4	DU	100.00	0.0	100.00	0	0	0	0	1	0	0	0	8.0	6.0
352	1994	BR	5	DU	20.00	0.0	20.00	0	0	0	0	1	0	0	0	4.0	2.0
353	1994	BR	6	DU	50.00	0.0	50.00	0	0	0	0	1	0	0	0	4.0	9.0
354	1994	BR	7	DU	60.00	0.0	60.00	0	0	0	0	1	0	0	0	4.0	3.0

Table 7.2-1. Camping and Day Use Visitor Expenditure Function Observations (continue).

Observation Number	Year	Site	Questionnaire Number	Visitor Type	Expenditures	Number of Days	Expenditures per Day	Upper Truckee River UTR	Donner Lake DL	Promer Reservoir PR	Stampede Reservoir SR	Boca Reservoir BR	Lower Truckee River LTR	Fynnsid Lake PL	Camping Visitor	Activity Hours	Group Size
355	1994	BR	8	DU	20.00	0.0	20.00	0	0	0	0	1	0	0	0	4.0	5.0
356	1994	BR	9	DU	25.00	0.0	25.00	0	0	0	0	1	0	0	0	5.0	5.0
357	1994	BR	10	DU	22.00	0.0	22.00	0	0	0	0	1	0	0	0	12.0	2.0
358	1994	BR	11	DU	70.00	0.0	70.00	0	0	0	0	1	0	0	0	10.0	1.0
359	1994	BR	12	DU	95.00	0.0	95.00	0	0	0	0	1	0	0	0	6.0	13.0
360	1994	BR	13	DU	8.00	0.0	8.00	0	0	0	0	1	0	0	0	4.0	2.0
361	1994	BR	14	DU	45.00	0.0	45.00	0	0	0	0	1	0	0	0	3.0	6.0
362	1994	PL	1	CP	120.00	3.0	40.00	0	0	0	0	0	0	1	1	11.9	2.0
363	1994	PL	2	CP	500.00	4.0	125.00	0	0	0	0	0	0	1	1	12.0	9.0
364	1994	PL	3	CP	10.00	3.0	3.33	0	0	0	0	0	0	1	1	10.0	15.0
365	1994	PL	4	CP	150.00	2.0	75.00	0	0	0	0	0	0	1	1	9.0	4.0
366	1994	PL	5	CP	83.75	2.0	41.88	0	0	0	0	0	0	1	1	7.0	8.0
367	1994	PL	6	CP	86.00	2.0	43.00	0	0	0	0	0	0	1	1	9.0	3.0
368	1994	PL	7	CP	125.00	2.0	62.50	0	0	0	0	0	0	1	1	5.0	4.0
369	1994	PL	8	CP	56.00	3.0	18.67	0	0	0	0	0	0	1	1	7.0	2.0
370	1994	PL	9	CP	15.00	3.0	5.00	0	0	0	0	0	0	1	1	6.0	4.0
371	1994	PL	10	CP	130.00	3.0	43.33	0	0	0	0	0	0	1	1	12.0	5.0
372	1994	PL	11	CP	100.00	2.0	50.00	0	0	0	0	0	0	1	1	12.0	14.0
373	1994	PL	12	CP	105.00	2.0	52.50	0	0	0	0	0	0	1	1	12.0	4.0
374	1994	PL	13	CP	150.00	2.0	75.00	0	0	0	0	0	0	1	1	2.0	4.0
375	1994	PL	14	CP	445.00	4.0	111.25	0	0	0	0	0	0	1	1	12.0	5.0
376	1994	PL	15	CP	314.00	2.0	157.00	0	0	0	0	0	0	1	1	11.0	6.0
377	1994	PL	16	CP	253.00	3.0	84.33	0	0	0	0	0	0	1	1	12.0	4.0
378	1994	PL	17	CP	155.00	10.0	15.50	0	0	0	0	0	0	1	1	6.0	3.0
379	1994	PL	18	CP	300.00	4.0	75.00	0	0	0	0	0	0	1	1	11.0	5.0
380	1994	PL	19	CP	152.00	2.0	76.00	0	0	0	0	0	0	1	1	12.0	4.0
381	1994	PL	1	DU	20.00	0.0	20.00	0	0	0	0	0	0	1	0	4.0	6.0
382	1994	PL	2	DU	240.00	0.0	240.00	0	0	0	0	0	0	1	0	7.0	26.0
383	1994	PL	3	DU	50.00	0.0	50.00	0	0	0	0	0	0	1	0	5.0	3.0
384	1994	PL	4	DU	6.00	0.0	6.00	0	0	0	0	0	0	1	0	6.0	4.0
385	1994	PL	5	DU	65.00	0.0	65.00	0	0	0	0	0	0	1	0	6.0	9.0
386	1994	PL	6	DU	72.00	0.0	72.00	0	0	0	0	0	0	1	0	4.0	3.0
387	1994	PL	7	DU	60.00	0.0	60.00	0	0	0	0	0	0	1	0	8.0	2.0
388	1994	PL	8	DU	36.00	0.0	36.00	0	0	0	0	0	0	1	0	2.0	4.0
389	1994	PL	9	DU	70.00	0.0	70.00	0	0	0	0	0	0	1	0	5.0	5.0
390	1994	PL	10	DU	116.00	0.0	116.00	0	0	0	0	0	0	1	0	2.0	5.0
391	1994	PL	11	DU	45.00	0.0	45.00	0	0	0	0	0	0	1	0	8.0	4.0
392	1994	PL	12	DU	70.00	0.0	70.00	0	0	0	0	0	0	1	0	8.0	2.0
393	1994	PL	13	DU	41.00	0.0	41.00	0	0	0	0	0	0	1	0	8.0	2.0
394	1994	PL	14	DU	25.00	0.0	25.00	0	0	0	0	0	0	1	0	3.0	3.0
395	1994	PL	15	DU	40.00	0.0	40.00	0	0	0	0	0	0	1	0	7.0	4.0
396	1994	PL	16	DU	25.00	0.0	25.00	0	0	0	0	0	0	1	0	2.0	3.0
397	1994	PL	17	DU	50.00	0.0	50.00	0	0	0	0	0	0	1	0	6.0	4.0
398	1994	PL	18	DU	20.00	0.0	20.00	0	0	0	0	0	0	1	0	2.0	2.0
399	1994	PL	19	DU	75.00	0.0	75.00	0	0	0	0	0	0	1	0	7.0	5.0
400	1994	PL	20	DU	15.00	0.0	15.00	0	0	0	0	0	0	1	0	10.0	4.0
401	1994	PL	21	DU	51.00	0.0	51.00	0	0	0	0	0	0	1	0	6.0	4.0
402	1994	PL	22	DU	121.00	0.0	121.00	0	0	0	0	0	0	1	0	6.0	13.0
403	1994	PL	23	DU	76.00	0.0	76.00	0	0	0	0	0	0	1	0	6.0	14.0
404	1994	PL	24	DU	35.00	0.0	35.00	0	0	0	0	0	0	1	0	2.0	3.0
405	1994	PL	25	DU	95.00	0.0	95.00	0	0	0	0	0	0	1	0	8.0	15.0
406	1994	PL	26	DU	25.00	0.0	25.00	0	0	0	0	0	0	1	0	5.0	3.0
407	1994	PL	27	DU	12.00	0.0	12.00	0	0	0	0	0	0	1	0	7.0	6.0
408	1994	PL	28	DU	55.00	0.0	55.00	0	0	0	0	0	0	1	0	6.0	4.0
409	1994	PL	29	DU	36.00	0.0	36.00	0	0	0	0	0	0	1	0	8.0	15.0
410	1994	PL	30	DU	36.00	0.0	36.00	0	0	0	0	0	0	1	0	6.0	4.0
411	1994	PL	31	DU	25.00	0.0	25.00	0	0	0	0	0	0	1	0	6.0	6.0
412	1994	PL	32	DU	15.00	0.0	15.00	0	0	0	0	0	0	1	0	5.0	2.0
413	1994	PL	33	DU	90.00	0.0	90.00	0	0	0	0	0	0	1	0	6.0	6.0

Table 7.2-1. Camping and Day Use Visitor Expenditure Function Observations (continue).

Observation Number	Year	Site	Questionnaire Number	Visitor Type	Expenditures	Number of Days	Expenditures per Day	Upper Truckee River UTR	Damner Lake DL	Promer Reservoir PR	Stampede Reservoir SR	Boca Reservoir BR	Lower Truckee River LTR	Pyramid Lake PL	Camping Visitor	Activity Hours	Group Size
414	1994	PL	34	DU	67.00	0.0	67.00	0	0	0	0	0	0	1	0	3.0	8.0
415	1994	PL	35	DU	19.00	0.0	19.00	0	0	0	0	0	0	1	0	5.0	2.0
416	1994	PL	36	DU	55.00	0.0	55.00	0	0	0	0	0	0	1	0	10.0	6.0
417	1994	PL	37	DU	130.00	0.0	130.00	0	0	0	0	0	0	1	0	3.0	5.0
418	1994	PL	38	DU	31.00	0.0	31.00	0	0	0	0	0	0	1	0	5.0	5.0
419	1994	PL	39	DU	35.00	0.0	35.00	0	0	0	0	0	0	1	0	4.0	5.0
420	1994	PL	40	DU	65.00	0.0	65.00	0	0	0	0	0	0	1	0	8.0	10.0
421	1994	PL	41	DU	195.00	0.0	195.00	0	0	0	0	0	0	1	0	8.0	13.0
422	1994	PL	42	DU	70.00	0.0	70.00	0	0	0	0	0	0	1	0	5.0	6.0
423	1994	PL	43	DU	25.00	0.0	25.00	0	0	0	0	0	0	1	0	2.0	2.0
424	1994	PL	44	DU	35.00	0.0	35.00	0	0	0	0	0	0	1	0	5.0	11.0
425	1994	PL	45	DU	57.00	0.0	57.00	0	0	0	0	0	0	1	0	6.8	7.0
426	1994	PL	46	DU	50.00	0.0	50.00	0	0	0	0	0	0	1	0	12.0	2.0
427	1994	PL	47	DU	7.00	0.0	7.00	0	0	0	0	0	0	1	0	3.5	5.0
428	1994	PL	48	DU	190.00	0.0	190.00	0	0	0	0	0	0	1	0	5.0	15.0
429	1994	PL	49	DU	17.00	0.0	17.00	0	0	0	0	0	0	1	0	4.0	3.0
430	1994	PL	50	DU	30.00	0.0	30.00	0	0	0	0	0	0	1	0	5.0	2.0
431	1994	PL	51	DU	28.00	0.0	28.00	0	0	0	0	0	0	1	0	5.0	2.0
432	1994	PL	52	DU	36.00	0.0	36.00	0	0	0	0	0	0	1	0	10.0	10.0

Table 7.2-2. Camping and Day Use Visitor Expenditure Function Values.

	Upper Truckee River	Donner Lake	Prosser Reservoir	Stampede Reservoir	Boca Reservoir	Lower Truckee River	Pyramid Lake
Camping Visitor Group Expenditures per Day	\$53.95	\$30.80	\$28.43	\$40.08	\$38.09	\$19.74	\$39.83
Day Use Visitor Group Expenditures per Day	\$75.42	\$36.65	\$30.93	\$45.78	\$46.86	\$28.60	\$53.60

7.3. Survey of the Second-Home Owners

A survey of second-home owners for the Truckee area was done during February 1995. The purpose of the survey was to first obtain an overall picture of the summer season visitation and recreation activities of second-home owners, second, quantify the amount of expenditures that second-home owners make to the local economy, and third, identify how second-home visitation would change during the summer season in relation to alternative lake-levels at Donner Lake. To achieve this purpose, information was collected from second-home owners using a questionnaire. Questionnaires were mailed-out to second-home owners and when returned the data was compiled and analyzed to develop a set of descriptive statistics. The cover letter to the questionnaire, the questionnaire, a response summary, descriptive statistics of the data, and comments are presented below.

Cover Letter

February 15, 1995

Dear Second-Home Owner:

The Town of Truckee requests your participation in a survey. This survey is being conducted by the University of Nevada, Reno. Information collected will be used in assessing the economic and recreation issues associated with lakes and reservoirs in the Truckee area. This information will help local, state, and federal officials make informed decisions on how best to manage the lakes, reservoirs, and rivers in the Truckee River Basin.

The enclosed questionnaire takes less than 15 minutes to complete. A limited number of second-home owners are receiving this questionnaire, so your response means a lot. Please complete the questionnaire as best you can and then mail the questionnaire in the stamped pre-addressed envelope.

The tabulated results of this survey will be made available for your review at the Truckee Town Hall. The Town of Truckee appreciates your participation in this survey and thanks you for your time.

**PLEASE RETURN YOUR COMPLETED QUESTIONNAIRE BEFORE
MARCH 1ST.**

Sincerely,

Embree B. (Breeze) Cross
Mayor