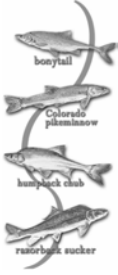


**Operation of
Flaming Gorge Dam
Final Environmental
Impact Statement**

**Socioeconomics
Technical Appendix**





SOCIOECONOMICS TECHNICAL APPENDIX

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Socioeconomics

Technical Appendix



1.0 INTRODUCTION

This technical appendix reviews the current economic environment that could be affected by implementation of either the No Action or Action Alternatives, discusses regional economic methods, and provides detailed results of the regional analysis. Under affected environment, a brief discussion of the geographic impact area is followed by a description of current conditions. Under environmental consequences, a methodology discussion is followed by regional economic impact results for each alternative, along with comparisons of the Action Alternative to the No Action Alternative.

This EIS presents two types of economic analyses, one measuring economic benefits and the other regional economic impacts. Regional economic impacts for this study have been developed based on recreation effects and are presented in the EIS under socioeconomics. Economic benefits have been estimated separately for agriculture, hydropower, and recreation and are presented within each relevant EIS section.

Regional economic impacts attempt to measure changes in total economic activity within a specified geographic region stemming from changes in within region expenditures. Regional economic impacts are typically described using such general indicators as output, income, and employment. Conversely, economic benefits attempt to measure changes in societal or national welfare based on a net value

concept.¹ Theoretically, nationally oriented economic benefit analyses attempt to provide a broader geographic focus compared to regional economic impact analyses. Unfortunately, in practice, the geographic difference between the analyses may be less pronounced given the difficulty in evaluating national implications of an action. If an action is relatively small from a national perspective, repercussions outside the directly impacted area may be insignificant. If the opposite is true, nationwide displacement or substitution effects may need to be taken into consideration. The difficulty lies in trying to estimate these substitution effects. For this analysis, the changes in economic benefits within the directly affected areas were assumed to be small enough so as not to create significant changes in national benefits. As a result, evaluation of nationwide substitution effects was deemed unnecessary.

One way to visualize the difference between regional economic impacts and economic benefits is to consider how each reacts to increases in regional expenditures. Regional economic impacts typically increase as in-region expenditures increase, whereas consumer surplus/profitability benefits tend to decrease as costs or expenditures alone increase. It should be noted that regional economic impacts and benefits often move in unison since they both typically rise or fall with levels of production (including recreation visitation). On the benefit side, as production changes, so do both production costs/expenditures and revenues/total consumer benefits, the net effect is that benefits generally move in the same direction as production changes. Nevertheless, there are many situations where changes in benefits and economic impacts diverge. This potential for divergence, along with the fact that different user groups are often interested in different economic measures, creates a need for both analyses.

Given the above discussion, the basic objective of the regional economic analysis is to measure changes in total economic activity within the affected region for the Action Alternative as compared to the No Action Alternative. The proposed Action Alternative potentially affects regional economic activity mainly through changes in: 1) costs of agricultural production due to flooding effects on irrigated acreage, 2) recreational expenditures due to the effects of changes in reservoir water levels and river flows on recreation visitation, and 3) costs of electricity as the timing and production of hydropower varies with the fluctuation in releases from Flaming Gorge Dam. Flooding effects upon agricultural lands along the Green River proved to be relatively minor and were consequently dropped from the regional analysis. Regional impacts due to losses in hydropower generation were also deemed to be relatively insignificant locally given any increased costs of power generation would be distributed across thousands of power users throughout the Western United States. Also, given this EIS is primarily a reservoir re-operation study, the lack of structural adjustments to the dam implies that construction costs would be minimal. Other typically encountered project purposes, such as municipal and industrial uses, were either not applicable or not significantly affected. Bottomline, the only factor used to evaluate changes in regional economic activity were the changes in recreation expenditures.

Regional economic impacts were measured using input-output (I-O) analysis. I-O estimates regional economic impacts based on a region's inter-industry trade linkages. The analyses present changes in total economic impact as measured by the sum of direct effects (impacts to

¹ For consumers, economic welfare reflects the value of goods and services consumed above what is actually paid for them. Such consumer welfare estimates are measured in terms of willingness-to-pay (WTP) in excess of cost, otherwise referred to as consumer surplus. This is the approach used in the recreation and hydropower analyses. While the hydropower analysis does not go through the process of estimating WTP, by focusing on differences in the replacement cost of power which are passed along to consumers, the resulting benefit measure is essentially the same. For producers or businesses, economic welfare is generally reflected in terms of gross revenues minus operating costs, otherwise referred to as profitability. This latter approach is used in the agriculture analysis.

initially affected industries), indirect effects (impacts to industries providing inputs to directly impacted industries, i.e., backward linkages), and induced effects (impacts from employees spending wages within the region) all caused by the initial change in demand. For example, if \$1,000 in agricultural product is lost from irrigated acreage idled by flooding (direct effect), and the farmer buys \$500 less in seed and fertilizer from the local store (indirect effect), and the farm workers spend \$100 less for household goods and services within the region (induced effect), then the total loss in output from regional agriculture is \$1,000, but the total regional output loss is \$1,600.

Three measures of regional economic activity provide the basis of the evaluation: total industry output, total labor income, and employment.

- ❖ Total Industry Output: Dollar value of production (sales revenues and gross receipts) from all industries in the region. Total industry output includes the value of inter-industry trade of intermediate goods prior to final manufacture and sale.
- ❖ Total Labor Income: Employment income derived at the workplace including wages and benefits (employee compensation) plus self-employed income (proprietary income).
- ❖ Employment: Total of hourly wage, salary, and self-employed jobs (part-time and full-time), measured in terms of number of jobs, not full-time equivalents.

The majority of the regional analysis discussion is based on the results of a regional modeling effort. In addition, information is presented at the end of the Action Alternative section on the results of surveys conducted with commercial guide operators on both the Green River and Flaming Gorge Reservoir. It was anticipated that commercial guide operators, particularly those on the Green River, may be adversely affected by the Action Alternative. Given the regional analysis focused on a three-county area, impacts to commercial guide operators would not be directly discernible. As a result, surveys of commercial guide operators were conducted to try and identify impacts. Other tourist oriented sectors, such as lodging and restaurants, were not anticipated to be as adversely affected since they cater to both river and reservoir recreators.

2.0 AFFECTED ENVIRONMENT

This section includes a brief discussion of the geographic impact area followed by descriptions of current conditions.

2.1 Geographic Impact Area (Region)

As described under the recreation section, the recreation analysis focuses on effects at Flaming Gorge Reservoir and along the Green River primarily within the Flaming Gorge NRA. Flaming Gorge Reservoir is located within Sweetwater County, Wyoming and Daggett County, Utah. The relevant portions of the Green River are located within Daggett County, Utah. Access to the northern portions of the reservoir would likely involve economic activity in the Wyoming towns of Green River and Rock Springs. Conversely, access to the southern reaches of the reservoir and the Green River may involve economic activity in more southern communities. Since Daggett County has little by way of significantly sized communities, the decision was made to include

Uintah County, Utah, within the impact region due to the influence of the town of Vernal. As a result, the geographic impact area for both the reservoir and river recreation analyses includes all three counties.

2.2 Current Conditions

The latest available data for the IMPLAN regional input-output model used in the analysis reflects regional economic activity for calendar year 1999 (for information on the IMPLAN model, see section 3.1 on Regional Economic Impact Analysis Methodology). Table 1 presents “current” base year 1999 conditions from the IMPLAN three-county model for total industry output, employment, and labor income. The table is broken down by major aggregated industry as well as the eight most directly impacted recreation oriented economic sectors identified in the analysis. The eight directly impacted sectors are shown separately, but under their associated major industry (e.g., “air transportation” is presented separately, but under transportation). Adding the separately presented directly impacted sectors with their associated major industry provides an estimate of the total for that industry (e.g., adding “air transportation” with “other transportation estimates total transportation).

Reviewing the percentages in table 1, the most important industries vary depending on the measure. From an output perspective, the top five industries include mining (33.8 percent [%]), transportation (12.0%), services (9.7%), construction (8.4%), and manufacturing (8.1%). Conversely, from an employment perspective, the top five industries include services (20.9%), retail trade (17.6%), government (17.3%), mining (10.8%), and manufacturing (8.3%). Comparing services and mining under these two perspectives indicates that the service industry is relatively more labor intensive than the mining industry. Similarly, the government sector appears to involve a fairly significant work force, but a relatively low level of marketable output. Finally, the top five industries from the perspective of labor income includes mining (22.1%), government (16.1%), transportation (14.8%), services (13.1%), and construction (8.7%). Comparing these percentages to the employment percentages provides an indication as to the relatively high and low paying industries. Mining and transportation appear to be high paying industries given they reflect only 10.8 and 7.6% of employment, but 22.1 and 14.8% of labor income respectively. The opposite appears to be true for the retail trade and service industries.

The eight directly impacted sectors, from a recreation expenditure perspective, combined to provide 5.4% of total industry output, 16.6% of employment, and 7.3% of labor income. These directly impacted sectors are fairly significant contributors to regional employment, but are relatively insignificant in terms of output and income. Food stores, automobile dealers and service stations, eating and drinking establishments, miscellaneous retail stores, and hotels and lodging places in particular combine for 16.1% of total regional employment.

3.0 ENVIRONMENTAL CONSEQUENCES

This section describes the regional economic impact methodology as well as the results of the analyses.

Table 1: Current Conditions Data Year: 1999		(Impact Area Counties: Daggett and Uintah, Utah, Sweetwater, Wyoming)					
Primary Industries/Sectors	IMPLAN Industry Number	Total Industry Output		Employment		Labor Income	
		Millions of Dollars (\$M)	% of Total	No. of Jobs	% of Total	Millions of Dollars (\$M)	% of Total
Agriculture, Forestry, Fishing	1-27	50.8	1.3	1,340	3.5	15.9	1.2
Mining	28-47, 57	1,349.7	33.8	4,146	10.8	283.9	22.1
Construction	48-56	335.5	8.4	3,210	8.3	111.3	8.7
Manufacturing	58-432	322.1	8.1	1,728	4.5	85.4	6.7
Other Transportation	433-436, 438-440	471.8	11.8	2,899	7.5	187.4	14.6
- Air Transportation:	437	6.4	0.2	74	0.1	2.7	0.2
Communications	441-442	45.7	1.1	194	0.5	11.1	0.9
Utilities	443-446	285.2	7.1	625	1.6	45.4	3.5
Wholesale Trade	447	89.3	2.2	1,074	2.8	36.9	2.9
Other Retail Trade	448-449, 452-453	52.9	1.3	1,579	4.1	25.8	2.0
- Food Stores:	450	32.2	0.8	882	2.3	18.9	1.5
- Automotive Dealers & Service Stations:	451	55.4	1.4	1,076	2.8	25.3	2.0
- Eating & Drinking:	454	66.5	1.7	2,292	6.0	22.6	1.8
- Miscellaneous Retail:	455	17.1	0.4	921	2.4	8.4	0.7
Finance, Insurance, & Real Estate (FIRE)	456-462	206.2	5.2	1,769	4.6	27.2	2.1
Other Services	464-476, 478-487, 489-509	345.7	8.7	6,891	17.9	152.1	11.9
- Hotels and Lodging Places:	463	36.1	0.9	1,004	2.6	14.4	1.1
- Automobile Rental and Leasing:	477	.4	0.0	13	0.0	0.1	0.0
- Amusement and Recreation Services:	488	3.2	0.1	149	0.4	1.4	0.1
Federal, State, and Local Government	510-515, 519-523	261.7	6.6	6,659	17.3	207.1	16.1
TOTAL:		3,993.7	100	38,523	100	1,283.3	100
MOST AFFECTED SECTORS:		217.3	5.4	6,410	16.6	93.8	7.3

3.1 Regional Economic Impact Analysis Methodology

The majority of the regional analysis discussion is based on the results of a regional modeling effort. In addition to the regional modeling results, a brief discussion is presented at the end of the Action Alternative section on the results of surveys conducted with commercial operators on both the Green River and Flaming Gorge Reservoir.

3.1.1 Regional Modeling Methodology

The regional economic impact analysis involves running alternative specific estimates of recreation expenditures through the IMPLAN input output model of the three-county regional economies. The IMPLAN (IMPact analysis for PLANning) model was originally developed by the U.S. Department of Agriculture Forest Service to assist in land and resource planning. This personal computer based software is widely used for the development of regional economic analyses.

Input-output analysis is a procedure for examining relationships both between businesses and between businesses and consumers. The analysis captures all the monetary market transactions

within a specified region for a given period of time via the inter-industry transaction table. The resulting mathematical formulas allow for examination of the effects of a change in one or more economic activities upon the overall regional economy (Minnesota IMPLAN Group, Inc., 2000).

Regional economic effects stemming from river and reservoir recreational activities within the three-county Utah/Wyoming area are driven by levels of within region recreation expenditures. The recreation analysis developed visitation results by month and activity for each alternative and hydrologic condition (i.e., average, dry, and wet water conditions). This information, combined with estimates of recreational expenditures per visit by month and activity for each alternative and hydrologic condition allowed for calculation of total within region recreational expenditures by alternative and hydrologic condition. Changes in recreational expenditures for the Action Alternative compared to the No Action Alternative for each hydrologic condition were entered into the IMPLAN model. The resulting differences in regional economic activity between the Action Alternative and No Action Alternative for each hydrologic condition provide a measure of the regional economic impacts associated with the Action Alternative.

As described under the affected environment current conditions section, the latest available IMPLAN data reflects regional economic activity during 1999. While the total recreation expenditure information reflects visitation and expenditures per visit during 2000-2001, the difference in years was considered insignificant enough to assume the 1999 version of the regional economy was reflective of the No Action Alternative. Given that 1999 was a wet year for both the river and reservoir, the underlying picture of the economy was considered analogous to the No Action Alternative wet condition. To estimate regional economic conditions for the No Action Alternative under average and dry conditions, differences in recreation expenditures for the No Action average and dry conditions were estimated as compared to No Action wet conditions. The expenditure differences were entered into IMPLAN to calculate regional economic activity under No Action average and dry conditions. The differences in Action Alternative expenditures compared to No Action expenditures under average, wet, and dry conditions were also run through IMPLAN to estimate impacts for the Action Alternative.

Typically, a recreation oriented regional analysis focuses on the expenditures made by nonlocal recreators, defined as recreators who do not reside in the region of interest. The logic is that increases or decreases in within region recreational expenditures by local residents would likely represent a wash to the regional economy since those expenditures would displace other within region expenditures. For example, if we anticipate that a local recreator will take more rafting trips and spend more money recreating on the Green River as a result of an alternative, the standard logic assumes that individual would reduce within region expenditures for other items, not necessarily recreational items, by an equal amount. The resulting implication is this transfer of within region spending would have very little effect upon regional economic activity. While this assumption sounds reasonable, it is often faulty for several reasons. First, it is possible that additional within region recreational expenditures may displace recreational spending outside the region, implying substitution of recreation visits between sites. In this case, the additional spending would reflect a true gain for the region. Secondly, even if the additional within region recreational expenditures did displace other within region expenditures, differences in the types or size of expenditures could affect the level of regional economic activity. If within region recreation expenditures for gas, food, etc. associated with the additional recreation visitation displaced within region expenditures for going to the movies or some other within region activity, the fact that the expenditures are incurred within different economic sectors would imply different regional effects. As a result, the decision was made to evaluate regional economic impacts based on all recreation expenditures, not just those expenditures generated by nonlocal residents. No attempt was made to estimate the level of offset in recreational expenditures for

local residents given the inherently speculative nature of such an analysis. As a result, the regional impacts for recreation may be somewhat overstated.

Average per visit current total recreation expenditures by activity within the region were obtained from the recreation survey described within the recreation section. Information was also gathered from the survey as to the breakdown of expenditures by expenditure category. Expenditure categories include camping fees, lodging, restaurants, groceries and liquor, gasoline, recreation supplies, guide services, car rental, other rentals, public transportation, and other. Expenditure categories varied somewhat by activity. For example, guide boat fishing was the only activity which included guide services.

In addition to the current recreation expenditure information, the survey also asked if the recreator's length of visit might increase under preferred river flow and reservoir water level conditions. The results of this preferred conditions length of trip question were adjusted downward using the conservative, but often applied approach of assuming nonrespondent responses would be equal to zero. The preferred conditions length of visit was divided by the current average length of visit to estimate a percentage increase in length of visit under preferred conditions for each recreation activity. These activity specific percentage increases were applied to current per visit expenditures to estimate per visit expenditures by activity under preferred conditions.

As with the recreation analysis, current and preferred conditions were used to develop recreation expenditures per visit by activity for each alternative using an interpolation approach. Assuming length of stay per visit, and consequently expenditures per visit, peak under preferred conditions, an inverted U-shaped distribution was assumed to hold for recreation expenditures as it did for recreation visitation and value. A high end kink expenditure estimate was developed as in the recreation analysis. The high end kink was assumed to fall at proportionally the same position as the current condition expenditure location. Low end and high end thresholds, points where river flows or reservoir water levels were so low or high as to prevent use, were also obtained from the survey. The high end kink was assumed to fall the same percentage distance from the preferred flow/WL as the current conditions data point. If current conditions falls 75% of the way between preferred conditions and the low end threshold, then the high end kink was also assumed to fall 75% of the way between preferred conditions and the high end threshold. Including the high end kink, five data points now exist for conducting a linear interpolation of per visit recreation expenditures (i.e., low end threshold, current conditions, preferred conditions, high end kink, and high end threshold).

Instead of doing an interpolation using all five data points as was done in the recreation analyses, a modified interpolation was done using only the current conditions, preferred conditions, and high end kink data points. The logic for this was that for conditions below current conditions or above high end kink conditions, the full scale interpolation would predict recreation expenditures per visit to fall below current expenditures. While this may sound reasonable, at the extremes where conditions approach the low or high end thresholds, per visit expenditures would be estimated to approach zero. While values per trip may indeed approach zero for the last few visits taken, the expenditures for those visits will obviously not decline to zero. As a result, the decision was made to only interpolate between current conditions and the high end kink. This results in expenditures per visit falling within the range of current conditions to preferred conditions (note that the expenditures for the high end kink would be equivalent to current conditions). For cases where river flows or reservoir water levels fall below current conditions or above high end kink conditions, the expenditures per visit were assumed to hold at current/high end kink levels. To the extent that actual visit length declines below current visit length, the

assumption that expenditures wouldn't drop below current expenditures per visit may somewhat overstate total expenditures. The following presents the information on the three data points used in the interpolations.

1) Current Expenditures

Current and high end kink expenditures per visit were developed separately for Green River and Flaming Gorge Reservoir recreation activities based on information obtained from the recreation survey. Given that the high end kink is analogous to current conditions from an expenditure per visit perspective, the expenditures per visit for current and high end kink conditions were assumed to be the same.

A) Green River Current/High End Kink Expenditures per Visit

To calculate current expenditures per visit by recreation activity, information was gathered from two primary questions from the recreation survey. The first question asked how much the recreator spends per visit on average for each of the expenditure categories. The second question asked how much the recreator spent on average by recreation activity. Combining the two questions allows for estimation of the expenditures per visit by recreation activity and expenditure category. Instead of trying to ask complex questions about costs by expenditure category for each recreation activity, this approach gets to essentially the same information.

As with many of the recreation calculations, the conservative but often applied approach of assuming zero values for nonrespondents was again applied to calculate expenditures. Question responses from the survey were reported by Aukerman et al., 2002 in terms of the average values for those who responded to each question. For example, average public transportation costs for those that used it were calculated at \$255.71 per visit. But, only 7 of 195 respondents on the river indicated that they used public transit. Instead of calculating expenditures per visit based on the averages of the respondents, we assumed nonrespondents incurred zero costs for expenditure categories they didn't respond to. The result of this adjustment was to reduce total average expenditures across all activities from \$1,463.81 to \$316.22 per visit.

A couple of distinctions were made between presumed camping and non-camping trips and between guide boat fishing and other activities. For recreators who identified their primary activity as camping, an assumption was made that certain expenditure categories would not be relevant (e.g., lodging, restaurants, car rental, and public transportation). With the low overall expenditures per visit for Green River camping (\$80.59), this assumption leads to more reasonable expenditure estimates for the relevant expenditure categories. Similarly, guide boat fishing was separated from all other activities so that the expenditure for guide services could be included within the overall expenditure estimate.

Once these adjustments had been made, percentages were calculated for each expenditure category. Percentages by expenditure category for guide boat fishing, camping, and all other activities were applied to the current total expenditure estimates obtained from the survey for each recreation activity (scenic floating, guide boat fishing, private boat fishing, shoreline fishing/trail use, and camping) to estimate current expenditures by activity as shown in table 2.

B) Flaming Gorge Reservoir Current/High End Kink Expenditures per Visit

The approach used to estimate current/high end kink expenditures per visit for the reservoir followed closely the procedure described directly above for the river. However, a couple of differences need to be mentioned. First, given guide boat fishing is not a significant activity on

Expenditure Categories	Scenic Floating	Guide Boat Fishing	Private Boat Fishing	Shoreline Fishing/ Trail Use	Camping
Camping Fees	\$ 25.14	\$ 20.49	\$ 17.95	\$ 10.53	\$ 10.32
Lodging	64.00	52.14	45.68	26.80	0
Restaurants	50.00	40.73	35.69	20.94	0
Groceries and Liquor	55.75	45.42	39.80	23.35	22.89
Gasoline	54.58	44.47	38.96	22.86	22.41
Recreation Supplies	32.51	26.49	23.21	13.62	13.35
Guide Services	0	444.10	0	0	0
Car Rental	22.95	18.70	16.38	9.61	0
Other Rentals	19.33	15.75	13.80	8.10	7.94
Public Transit	9.96	8.12	7.11	4.17	0
Other	8.95	7.29	6.39	3.75	3.68
Total:	\$ 343.17	\$ 723.70	\$ 244.97	\$ 143.73	\$ 80.59

the reservoir, it was dropped from the analysis. As a result, no distinction needed to be made between activities based on the incorporation of a guide services expenditure category. Second, as with the river analysis, expenditure category differences were assumed between camping and non-camping activities (e.g., lodging, restaurants, car rental, and public transportation costs were assumed irrelevant on a camping visit). For the reservoir analysis, the camping based percentages of costs by expenditure category were applied to both camping and swimming/waterplay. The swimming/waterplay total expenditure per visit estimate was so low (only \$55.24) as to make it questionable to divide the cost among all expenditure categories. Survey results indicated that average length of visit for swimming visits did exceed one day suggesting that we could not assume swimming visits were day trips. Given the low expenditures per visit, the assumption was made that swimmers typically camped. The resulting current/high end kink expenditures per visit by activity are presented in table 3.

2) Preferred Expenditures:

A) Green River Preferred Expenditures per Visit:

Similar to the river visitation calculation described under the recreation section, a survey question asked if recreators by activity would extend the length of their visits under preferred flow conditions. Average increased length of visit by activity was again adjusted downward assuming nonrespondents would not extend their visits. The adjusted increase in length of stay was divided by the average current length of stay to estimate a percentage increase in length of stay by recreation activity. The percentage increase in length of stay was applied to the current expenditures per visit by activity to estimate the expenditures per visit by activity under preferred flow conditions as presented in table 4.

Expenditure Categories	Power Boating/ Waterskiing	Boat Fishing	Boat Camping	Swimming/ Waterplay
Camping Fees	\$ 15.74	\$ 10.28	\$ 17.42	6.99
Lodging	14.15	9.25	0	0
Restaurants	19.85	12.97	0	0
Groceries and Liquor	32.24	21.06	35.68	14.31
Gasoline	48.42	31.64	53.59	21.50
Recreation Supplies	10.17	6.64	11.25	4.51
Other Rentals	5.22	4.41	5.78	2.32
Other	12.64	8.26	13.99	5.61
Total:	\$ 158.43	\$ 103.51	\$ 137.71	\$ 55.24

Expenditure Categories	Scenic Floating	Guide Boat Fishing	Private Boat Fishing	Shoreline Fishing/ Trail Use	Camping
Camping Fees	\$ 32.49	\$ 29.73	\$ 26.43	\$ 15.67	\$ 11.78
Lodging	82.72	75.65	67.25	39.92	0
Restaurants	64.63	59.10	52.55	31.19	0
Groceries and Liquor	72.06	65.90	58.60	34.78	26.14
Gasoline	70.55	64.52	57.36	34.05	25.59
Recreation Supplies	42.02	38.43	34.17	20.29	15.24
Guide Services	0	644.35	0	0	0
Car Rental	29.66	27.13	24.12	14.31	0
Other Rentals	24.98	22.85	20.32	12.06	9.07
Public Transit	12.87	11.78	10.47	6.21	0
Other	11.57	10.58	9.41	5.59	4.20
Total:	\$ 443.55	\$ 1,050.02	\$ 360.68	\$ 214.08	\$ 92.02

B) Flaming Gorge Reservoir Preferred Expenditures per Visit:

The procedure described directly above for the river was also applied to estimate the preferred Flaming Gorge Reservoir expenditures per visit as presented in table 5.

Table 5: Preferred Conditions Flaming Gorge Reservoir Expenditures per Visit				
Expenditure Categories	Power Boating/ Waterskiing	Boat Fishing	Boat Camping	Swimming/ Waterplay
Camping Fees	\$ 27.98	\$ 14.94	\$ 20.78	\$ 8.21
Lodging	25.16	13.44	0	0
Restaurants	35.29	18.85	0	0
Groceries and Liquor	57.32	30.61	42.57	16.81
Gasoline	86.08	45.99	63.94	25.26
Recreation Supplies	18.08	9.65	13.42	5.30
Other Rentals	9.28	4.96	6.90	2.73
Other	22.47	12.01	16.69	6.59
Total:	\$ 281.66	\$ 150.45	\$ 164.30	\$ 64.90

These three recreation expenditure data points (current expenditures, preferred expenditures, and high end kink expenditures), for both the river and reservoir, provided the basis for the per visit expenditure interpolations. As with the recreation visitation and valuation analyses, expenditures per visit were estimated by activity, month, alternative and hydrologic condition based on the associated river flows and reservoir water levels. The expenditures per visit by activity, month, alternative and hydrologic condition were applied to similar estimates of recreation visitation to calculate total expenditures by alternative and hydrologic condition. The changes in total expenditures by expenditure category for the Action Alternative compared to the No Action Alternative, were entered into the IMPLAN model to generate impact estimates associated with the Action Alternative.

3.1.2 Commercial Operator Survey Methodology

Given the regional analysis focused on a three-county area, and lack of county specific expenditure data precluded the development of county level regional economic impact models, anticipated adverse impacts to commercial guide operators concentrated within Daggett County would not be directly discernible. As a result, surveys of commercial guide operators were conducted to try and identify impacts.

The results of the surveys of both Green River and Flaming Gorge Reservoir recreational commercial operators is presented at the end of the Action Alternative subsection in terms of: 1) average visitation and revenue, 2) high end, low end, and preferred flows/water levels, and 3) preferred flow/water level visitation and revenue. Unfortunately, the survey data did not provide enough information to estimate impacts by alternative. However, the high end, low end, and preferred flows/water levels obtained from the survey were compared to flows and water

levels from March to October for each alternative under average, wet, and dry conditions. Attempts were made to evaluate which alternative would be preferred for each commercially supported recreation activity.

3.2 Regional Economic Impact Results

This section presents the results of the recreation expenditure based regional economic analysis. The results are presented by alternative, starting with the No Action Alternative.

3.2.1 No Action Alternative

Given the large volume of recreation expenditure estimates (estimates calculated for each of the eleven expenditure categories, for each recreation activity, for each month, for each alternative and hydrologic condition), the individual monthly estimates are not presented. Instead, information on No Action Alternative total recreation expenditures by expenditure category, hydrologic condition, site (river versus reservoir), and recreation activity are presented in table 6. These estimates portray the product of recreation visits from the recreation analysis times the expenditures per visit from the expenditure interpolations.

As mentioned above under methodology, given the IMPLAN 1999 base data is considered reflective of No Action Alternative wet conditions, table 6 also includes estimates of the differences in No Action average and dry expenditures as compared to No Action wet conditions. The gain in No Action Alternative average condition expenditures compared to No Action Alternative wet condition expenditures of \$23.6 million reflects almost a 20% increase. The decline in No Action dry expenditures compared to No Action wet expenditures of \$39.1 million reflects a 32.6% drop in recreation expenditures.

These expenditure differences were run through the IMPLAN model to estimate regional economic conditions under No Action average and dry hydrologic conditions. As presented in table 7, differences in the overall three-county regional economy were insignificant between No Action Alternative average, wet, and dry conditions. Looking at employment, the most volatile regional economic measure on a percentage basis, indicates that the 330 and 908 job declines compared to average conditions under wet and dry conditions respectively, reflect only a 0.9 and 2.3% reduction in overall employment.

Focusing in on the overall economy is important, but can gloss over industry by industry changes. To address this issue, reviews were also made of the eight most affected economic sectors, those sectors directly impacted by changing recreational expenditures. Table 8 describes the linkage from each recreation expenditure category to Standard Industrial Classification (SIC) industry codes to IMPLAN industry codes. Based on this table, the most directly affected IMPLAN industries are as follows: air transportation (#437), food stores (#450), automotive dealers and service stations (#451), eating and drinking (#454), miscellaneous retail (#455), hotels and lodging places (#463), automobile rental and leasing (#477), and amusement and recreation services (#488).

Comparing employment for the No Action Alternative under average and wet conditions shows a minor decline of 294 jobs (-4.4%) between these eight most affected sectors. The 805 job loss from average to dry conditions for these sectors was more noticeable reflecting a 12.0% drop. The nearly 44% decline in recreation expenditures under dry conditions compared to average conditions generated a much less severe decline in regional economic activity, even for the eight most affected sectors, implying that a significant share of recreation

2000-2001 \$																
Table 6: No Action Alternative Recreation Expenditures (\$1,000s)																
Expenditures Categories																
Hydrologic Condition	Site	Recreation Activity	Camping Fees	Lodging	Restaurants	Groceries	Gas	Supplies	Guides	Car Rental	Other Rentals	Public Transit	Other	Total		
Average	Green River	Scenic Floating	565.9	1,440.6	1,125.5	1,254.9	1,228.5	731.8	0	516.5	435.1	224.2	201.5	7,724.4		
		Guide Boat Fishing	221.3	563.1	439.9	480.3	480.3	286.1	296.5	202.0	170.1	87.7	78.7	7,816.2		
		Private Boat Fishing	318.0	809.2	632.2	690.1	690.1	411.1	499.0	0	290.2	244.5	126.0	13.2	4,339.5	
		Shoreline Fishing/Trail Use	385.7	981.8	767.1	855.4	837.5	439.0	30.7	0	352.0	266.7	152.8	137.4	5,265.6	
		Boat Based Camping	23.7	0	0	52.6	51.5	30.7	0	0	0	18.2	0	8.4	185.0	
			Total:	1,514.6	3,794.7	2,964.8	3,358.4	3,287.9	1,958.7	4,796.5	1,360.7	1,164.6	590.6	539.3	25,330.7	
	Flaming Gorge Reservoir	Power Boating/Waterskiing	8,928.7	8,029.1	11,261.9	19,292.6	27,470.6	5,769.5	0	0	0	2,961.1	0	7,170.2	89,883.7	
		Boat Fishing	2,491.3	2,241.3	3,143.0	5,104.1	7,668.6	1,609.2	0	0	0	826.8	0	2,002.7	25,087.0	
		Boat Camping	203.5	0	0	416.9	626.2	131.4	0	0	0	163.5	0	0	1,609.2	
		Swimming/Waterplay	168.2	0	0	344.4	517.5	108.6	0	0	0	55.9	0	0	1,329.6	
			Total:	11,791.7	10,270.4	14,404.9	24,158.1	36,282.9	7,618.7	0	0	3,911.4	0	9,471.4	117,909.4	
Wet	Green River	FGNRA Total:	13,306.3	14,065.1	17,369.7	27,516.5	39,570.8	9,577.4	4,796.5	1,360.7	5,076.0	590.6	10,010.7	149,240.1		
		Change from No Action Extremely Wet:	+2200.6	+2185.4	+2846.9	+4534.4	+6643.2	+1514.7	+977.7	+125.8	+792.4	+1703.1	+54.6	+23,578.3		
		Scenic Floating	546.0	1,389.9	1,086.0	1,210.8	1,185.3	706.0	227.8	0	488.3	419.8	216.3	194.4	7,453.0	
		Guide Boat Fishing	176.2	448.3	350.2	390.6	382.4	227.8	3,818.8	0	160.8	135.4	89.8	62.7	6,223.1	
		Private Boat Fishing	290.2	738.5	577.0	643.5	629.9	375.3	264.8	0	264.8	223.2	114.9	103.4	3,960.6	
	Flaming Gorge Reservoir	Shoreline Fishing/Trail Use	340.7	867.1	677.5	739.6	755.4	440.7	0	0	310.9	262.0	134.9	121.4	4,650.1	
		Boat Based Camping	18.1	0	0	40.2	39.4	23.5	0	0	0	14.0	0	6.5	141.6	
				Total:	1,371.2	3,443.9	2,690.7	3,040.5	2,976.6	1,773.2	3,818.8	1,234.9	1,054.4	536.0	488.2	22,428.4
		Power Boating/Waterskiing	7,223.2	6,494.8	9,110.0	14,796.4	22,221.2	4,667.5	0	0	0	2,395.7	0	5,801.1	72,709.9	
		Boat Fishing	2,157.6	1,941.0	2,722.1	4,420.2	6,640.7	1,393.5	0	0	0	716.0	0	1,734.0	21,725.1	
Dry	Green River	Boat Camping	196.8	0	0	403.1	605.5	127.1	0	0	65.3	0	0	158.1	1,555.8	
		Swimming/Waterplay	157.2	0	0	321.9	463.7	101.4	0	0	52.2	0	0	126.2	1,242.6	
				Total:	9,734.8	8,435.8	11,832.1	19,941.6	29,951.0	6,289.5	0	3,229.2	0	7,819.4	97,233.4	
		FGNRA Total:	11,106.0	11,879.7	14,522.8	22,982.1	32,927.6	8,062.7	3,818.8	1,234.9	4,283.6	536.0	8,307.6	119,661.8		
		Change from No Action Extremely Wet:	-3,309.3	-4,616.3	-4,864.8	-6,954.4	-9,248.1	-2,805.7	-2,186.3	-929.1	-1,549.1	-403.2	-2,197.7	-39,065.8		
	Flaming Gorge Reservoir	Scenic Floating	2.2	5.7	4.4	4.9	4.8	2.9	0	2.0	0	1.7	0.9	0.8	30.4	
		Guide Boat Fishing	75.2	191.4	149.5	166.8	163.3	97.3	0	1,630.5	66.7	57.8	29.8	26.8	2,657.0	
		Private Boat Fishing	138.0	351.3	274.5	306.1	299.6	178.5	0	0	126.0	106.1	54.7	49.2	1,883.9	
		Shoreline Fishing/Trail Use	119.6	304.6	238.0	265.4	259.8	154.8	0	0	109.2	92.0	47.4	42.6	1,638.5	
		Boat Based Camping	4.7	0	0	10.5	10.2	6.1	0	0	0	3.6	0	1.7	36.9	
		Total:	339.9	853.0	666.4	753.6	737.8	439.5	1,630.5	305.8	261.3	132.8	121.0	6,241.7		
Flaming Gorge Reservoir	Power Boating/Waterskiing	5,361.2	4,819.7	6,761.2	10,981.4	16,492.5	3,464.0	0	0	0	1,778.0	0	4,305.3	53,963.3		
	Boat Fishing	1,767.8	1,590.7	2,230.4	3,621.6	5,441.1	1,141.9	0	0	0	586.4	0	1,420.5	17,800.4		
	Boat Camping	180.7	0	0	370.1	555.9	116.7	0	0	0	60.0	0	0	1,426.6		
	Swimming/Waterplay	147.0	0	0	301.0	452.2	94.9	0	0	0	48.8	0	118.0	1,161.9		
			Total:	7,456.8	6,410.4	8,991.6	15,274.1	22,941.7	4,817.5	0	2,473.2	0	5,988.9	74,354.3		
		FGNRA Total:	7,796.7	7,263.4	9,658.0	16,027.7	23,679.5	5,257.0	1,630.5	305.8	2,734.5	132.8	6,109.9	80,596.0		
		Change from No Action Extremely Wet:	-3,309.3	-4,616.3	-4,864.8	-6,954.4	-9,248.1	-2,805.7	-2,186.3	-929.1	-1,549.1	-403.2	-2,197.7	-39,065.8		

Table 7: No Action Alternative		Data Year: 1999											
		(Impact Area Counties: Daggett and Uintah, Utah, Sweetwater, Wyoming)											
		Average Condition			Wet Condition			Dry Condition					
Primary Industries/Sectors	IMPLAN Industry Number	Total Industry Output (\$M)	Employment (Jobs)	Labor Income (\$M)	Total Industry Output (\$M)	Employment (Jobs)	Labor Income (\$M)	Total Industry Output (\$M)	Employment (Jobs)	Labor Income (\$M)	Total Industry Output (\$M)	Employment (Jobs)	Labor Income (\$M)
Agriculture, Forestry, Fishing	1-27	50.8	1,340	15.9	50.8	1,340	15.9	50.8	1,340	15.9	50.8	1,338	15.9
Mining	28-47, 57	1349.8	4,146	283.9	1,349.7	4,146	283.9	1,349.6	4,145	283.9	1,349.6	4,145	283.9
Construction	48-56	335.6	3,212	111.3	335.5	3,210	111.3	335.2	3,205	111.1	335.2	3,205	111.1
Manufacturing	58-432	322.2	1,729	85.4	322.1	728	85.4	322.0	1,727	85.4	322.0	1,727	85.4
Other Transportation	433-436, 438-440	472.0	2,901	187.5	471.8	2,899	187.4	471.5	2,892	187.3	471.5	2,892	187.3
- Air Transportation:	437	6.4	74	2.7	6.4	74	2.7	6.3	72	2.7	6.3	72	2.7
Communications	441-442	45.9	195	11.1	45.7	194	11.1	45.4	192	11.0	45.4	192	11.0
Utilities	443-446	285.4	626	45.4	285.2	625	45.4	284.8	623	45.3	284.8	623	45.3
Wholesale Trade	447	89.4	1,076	36.9	89.3	1,074	36.9	89.0	1,069	36.7	89.0	1,069	36.7
Other Retail Trade	448-449, 452-453	53.0	1,582	25.9	52.9	1,579	25.8	52.7	1,572	25.7	52.7	1,572	25.7
- Food Stores:	450	33.4	914	19.6	32.2	882	18.9	30.4	814	17.5	30.4	814	17.5
- Automotive Dealers & Service Stations:	451	56.8	1,103	25.9	55.4	1,076	25.3	53.5	1,021	24.0	53.5	1,021	24.0
- Eating & Drinking:	454	69.0	2,382	23.5	66.5	2,292	22.6	62.0	2,085	20.6	62.0	2,085	20.6
- Miscellaneous Retail:	455	17.5	945	8.7	17.1	921	8.4	16.4	867	8.0	16.4	867	8.0
Finance, Insurance, & Real Estate (FIRE)	456-462	206.8	1,776	27.3	206.2	1,769	27.2	205.0	1,750	27.0	205.0	1,750	27.0
Other Services	464-476, 478-487, 489-509	346.4	6,907	152.4	345.7	6,891	152.1	344.6	6,854	151.3	344.6	6,854	151.3
- Hotels and Lodging Places:	463	39.4	1,096	15.7	36.1	1,004	14.4	30.2	784	11.2	30.2	784	11.2
- Automobile Rental and Leasing:	477	0.5	14	0.1	.435	13	0.1	0.2	5	0.0	0.2	5	0.0
- Amusement and Recreation Services:	488	3.8	177	1.6	3.2	149	1.4	1.9	84	0.8	1.9	84	0.8
Federal, State, and Local Government	510-515, 519-523	261.8	6,660	207.2	261.7	6,659	207.1	21.5	6,656	207.0	21.5	6,656	207.0
TOTAL:		4008.8	38,853	1,288.2	3,993.7	38,523	1,283.3	3,966.4	37,757	1,272.3	3,966.4	37,757	1,272.3
Change from Average Condition (\$M, Jobs):					-15.1	-330	-4.9	-42.4	-1096	-15.9	-42.4	-1096	-15.9
(Percent):					-0.4	-0.9	-0.4	-1.1	-2.8	-1.2	-1.1	-2.8	-1.2
MOST AFFECTED SECTORS:		226.9	6,704	97.8	217.3	6,410	93.8	200.8	5,733	84.7	200.8	5,733	84.7
Change from Average Condition (\$M, Jobs):					-9.6	-294	-4.0	-26.1	-971	-13.1	-26.1	-971	-13.1
(Percent):					-4.2	-4.4	-4.1	-11.5	-14.5	-13.4	-11.5	-14.5	-13.4

Table 8: Conversion of SIC Code Industries to IMPLAN Industries					
Recreation Expenditure Category	SIC Industry Code Number	SIC Industry Name	Industry Description	IMPLAN Industry Number	IMPLAN Industry Name
Camping Fees	7033	Recreational Vehicle Parks and Campsites		463	Hotels and Lodging Places
Lodging	7011	Hotels and Motels		463	Hotels and Lodging Places
Restaurants	5812	Eating Places		454	Eating and Drinking
Groceries	5411	Grocery Stores		450 (retail)	Food Stores
Gasoline	5541	Gasoline Service Stations	Includes gasoline service stations, boat dealers, and recreation vehicle dealers	451 (retail)	Automotive Dealers and Service Stations
Recreation Supplies (fishing)	5941	Sporting Goods Stores and Bike Stops	Includes bait and tackle, fishing equipment.	455 (retail)	Miscellaneous Retail
Guide Services	7999	Amusement and Recreation Services, not elsewhere classified	Includes hunting and tourist guides	488	Amusement & Recreation Services, NEC
Car Rental	7514	Passenger Car Rental		477	Automobile Rental and Leasing
Other Rentals (boats)	7999	Amusement and Recreation Services, not elsewhere classified	Includes boat and canoe rental	488	Amusement and Recreation Services, NEC
Public Transit (airlines)	4512	Air Transportation, scheduled		437	Air Transportation
Other	5946 5947	Camera and Photographic Supply stores Gift, Novelty, and Souvenir Shops	Includes drug stores, liquor stores, sporting goods, camera and photographic supply stores, gift and souvenir shops	455 (retail)	Miscellaneous Retail

expenditures must pass through the economy without creating much impact. This is not surprising since the three-county economy has a relatively small manufacturing base suggesting much of the inputs to the most affected sectors likely come from outside the region.

3.2.2 Action Alternative

This section describes changes in regional economic activity associated with implementing the Action Alternative under average, wet, and dry conditions. For each hydrologic condition, changes in recreation expenditures compared to the No Action Alternative for the same hydrologic condition were run through the IMPLAN model. As a result, impacts are measured for the Action Alternative compared to the No Action Alternative within the context of the same hydrologic condition. In no instances are impacts measured across hydrologic conditions.

Table 9 presents recreation expenditures by category, recreation activity, site, and hydrologic condition for the Action Alternative. The table presents total expenditures as well as changes compared to the No Action Alternative in both dollar and percentage terms. Under all three hydrologic conditions, total Action Alternative expenditures are higher than those of the No Action Alternative. The gain in expenditures is about 5.6% under average conditions, 13.7% under wet conditions, and 22.7% under dry conditions.

While the overall change in expenditures is positive, this doesn't imply consistent expenditure gains on both the river and reservoir. The change in Action Alternative expenditures for the Green River follow the direction of the change in visitation—positive for the average condition and negative for the wet and dry conditions. Losses in river recreation expenditures were estimated at 38% and 60% compared to the No Action Alternative under wet and dry conditions, respectively. Conversely, changes in Action Alternative expenditures for Flaming Gorge Reservoir were positive under each hydrologic condition despite the lack of visitation change under average and wet conditions.

The facility availability approach, used to measure changes in reservoir visitation, is less sensitive than the interpolation approach for measuring gains in visitation as water levels rise. As a result, no changes in visitation were estimated for the reservoir under average and wet conditions. However, recreation expenditures are estimated based on both visitation and expenditures per trip. Since expenditures per trip are based on an interpolation, increases in expenditures per trip, due to increased length of stay associated with higher water levels, when applied to existing visitation levels, results in gains in recreation expenditures at the reservoir under both average and wet conditions. Under wet conditions, these gains in reservoir expenditures exceeded the losses in river expenditures leading to the odd situation of an estimated overall loss in visitation coupled with an overall gain in expenditures. Under dry conditions, gains in reservoir visitation and expenditures out weigh losses on the river.

While the overall level of expenditures shows gains compared to the No Action Alternative, the individual expenditure categories include both gains and losses. This is because expenditure categories vary by recreation activity and the visitation by activity varies by month, alternative, and hydrologic condition. Some activities may post gains while others show losses. The potential for both gains and losses in recreation visitation and recreation expenditures per trip across activities and months creates the possibility of both positive and negative expenditures. For example, losses in recreation expenditures for river guides under wet and dry conditions are not offset because they are applicable only to the guide boat fishing activity.

Hydrologic Conditions		2000-2001 \$														Total	
Table 9. Action Alternative Recreation Expenditures (\$1,000s)		Expenditures Categories															
Site	Recreation Activity	Camping Fees	Lodging	Restaurants	Groceries	Gas	Supplies	Guides	Car Rental	Other Rentals	Public Transit	Other	Total				
Average	Green River	Scenic Floating	1,496.6	1,601.7	1,568.1	984.1	0	552.2	286.0	257.1	8,858.9						
		Guide Boat Fishing	236.0	512.3	305.1	161.4	93.5	215.4	181.4	93.5	8,337.0						
		Private Boat Fishing	723.9	806.9	789.8	279.8	144.2	128.6	4,966.4								
		Shoreline Fishing/Trail Use	475.5	1,034.4	1,034.4	615.0	188.3	168.4	6,460.3								
		Boat Based Camping	19.5	43.3	42.4	25.2	7.0	152.3	0	0	0	0	0	0	0	0	
		Total:	1,817.1	4,029.5	3,944.9	2,350.0	5,116.0	1,640.6	847.0	29,805.0							
		Power Boating/Waterskiing	9,216.0	8,286.3	11,623.3	18,878.6	9,954.2	0	3,057.0	7,400.8							
		Boat Fishing	2,545.3	2,289.7	3,211.3	5,214.7	1,644.3	0	844.6	2,045.6							
		Boat Camping	207.2	0	424.4	637.4	133.8	0	68.8	166.4							
		Swimming/Waterplay	169.9	0	347.9	522.7	108.7	0	58.5	136.4							
Total:	12,138.4	10,575.9	14,834.6	24,865.6	7,841.9	0	4,027.0	9,749.2									
FGNRA Total:		13,955.5	15,151.6	18,409.6	28,995.1	41,291.1	10,191.9	5,116.0	1,640.6	5,424.1	7,120.0	10,396.2	151,183.9				
Change from No Action Alternative: \$:		649.2	1,086.5	1,039.9	1,378.6	1,720.3	614.5	319.5	279.9	348.1	121.4	385.5	7,843.8				
Change from No Action Alternative: %:		4.9	7.7	6.0	5.0	4.4	6.4	6.7	20.6	6.9	20.6	3.9	5.6				
Wet	Green River	Scenic Floating	312.3	795.2	621.3	692.7	678.2	403.9	285.2	240.1	111.2	4,263.8					
		Guide Boat Fishing	119.4	303.7	237.3	264.6	259.1	154.3	108.9	91.7	42.5	4,216.0					
		Private Boat Fishing	216.6	551.3	430.8	480.4	470.2	280.1	197.7	166.6	85.6	77.1	2,965.7				
		Shoreline Fishing/Trail Use	173.7	442.2	345.5	385.3	377.2	224.8	156.5	133.6	68.8	61.9	2,371.6				
		Boat Based Camping	12.0	0	26.7	26.7	15.5	9.2	4.3	0	0	0	0	0	0	0	0
		Total:	834.0	2,092.5	1,634.9	1,849.6	1,810.8	1,078.7	2,587.1	750.3	641.3	296.9	13,901.8				
		Power Boating/Waterskiing	9,273.5	8,338.4	11,696.1	18,997.0	28,529.7	5,991.8	0	3,076.5	7,446.6						
		Boat Fishing	2,557.7	2,300.7	3,227.0	5,239.7	1,652.2	0	849.1	2,055.9	25,754.5						
		Boat Camping	209.1	0	428.2	643.3	135.0	0	69.4	187.9	1,652.9						
		Swimming/Waterplay	169.0	0	345.8	519.6	109.0	0	56.1	135.6	1,335.1						
Total:	12,209.2	10,639.1	14,923.0	25,010.7	37,565.0	7,888.1	0	4,051.0	9,806.0	122,092.1							
FGNRA Total:		13,043.2	12,731.6	16,557.9	26,860.3	39,376.8	8,966.8	2,587.1	750.3	4,692.3	325.6	10,102.9	135,993.9				
Change from No Action Alternative: \$:		1,937.2	851.9	2,035.1	3,878.2	6,448.2	904.1	-1,231.7	-484.6	408.7	-210.4	1,795.3	16,332.1				
Change from No Action Alternative: %:		17.4	7.2	14.0	16.9	18.6	11.2	-32.3	-39.2	9.5	-39.3	21.6	13.7				
Dry	Green River	Scenic Floating	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Guide Boat Fishing	31.3	79.6	62.2	69.3	67.9	40.0	677.7	28.5	24.0	12.4	11.1	1,004.4			
		Private Boat Fishing	251.0	73.9	57.2	63.0	63.0	97.5	0	28.4	17.5	10.3	645.4				
		Shoreline Fishing/Trail Use	69.0	175.6	137.2	153.0	149.8	89.2	0	63.0	53.1	27.3	29.6	841.7			
		Boat Based Camping	6.1	0	0	13.6	13.3	7.9	0	4.7	0	0	2.2	47.9			
		Total:	135.4	328.9	257.0	300.1	293.8	175.1	677.7	117.9	104.1	51.2	48.2	2,469.3			
		Power Boating/Waterskiing	7,150.4	6,428.6	9,018.6	14,647.6	21,998.2	4,620.8	0	2,371.6	5,741.7						
		Boat Fishing	2,147.9	1,933.0	2,709.7	4,400.4	6,611.7	1,387.8	0	713.0	1,726.6						
		Boat Camping	191.9	0	393.1	590.4	123.9	0	63.7	0	154.1						
		Swimming/Waterplay	157.8	0	323.0	485.3	101.9	0	52.5	0	126.7						
Total:	9,647.9	8,361.6	11,728.3	19,764.1	29,685.7	6,234.4	0	3,200.8	7,749.1								
FGNRA Total:		9,783.3	8,690.5	11,985.3	20,064.2	29,979.5	6,409.5	677.7	117.9	3,304.9	51.2	7,797.3	98,861.2				
Change from No Action Alternative: \$:		1,996.6	1,427.1	2,327.3	4,096.5	6,300.0	1,152.5	-852.8	-187.9	570.4	-81.6	1,687.4	18,285.2				
Change from No Action Alternative: %:		25.5	16.7	24.1	25.2	26.6	21.9	-58.4	-61.5	20.9	-61.5	27.6	22.7				

The impacts of the Action Alternative under average, wet, and dry conditions are described in three separate tables to allow for presentation of both totals by industry and the changes compared to the No Action Alternative in terms of both dollars/jobs and percentage for all three regional economic impact measures.

Table 10 reports the effects of the Action Alternative under average conditions. The “total” columns for total industry output, employment, and labor income portray overall estimates of economic activity for each industry and for the economy as a whole. The “change from No Action” columns depict changes in both dollars/jobs and percent.

The overall change in Action Alternative total output, employment, and income compared to No Action average conditions was positive but quite small, reflecting less than a 1% change. Looking at the sum of the eight most directly affected sectors, the gains are somewhat higher in percentage terms indicating about a 1.5% change. The largest percentage change (gain) occurred in the automotive rental and leasing and the amusement and recreation services sectors, both small sectors in the three-county economy. These gains in economic activity associated with the Action Alternative under average conditions were considered insignificant from both the overall and most affected sector perspectives.

Table 11 reports the effects of the Action Alternative under wet conditions. The overall change in Action Alternative total output, employment, and income compared to No Action wet conditions was also positive but very small, again reflecting less than a 1% change. Looking at the sum of the eight most directly affected sectors, the gains were slightly higher in percentage terms indicating nearly a 3% change. The largest percentage change (loss) occurred in the automotive rental and leasing and the amusement and recreation services sectors, both small sectors in the three-county economy. These gains in economic activity associated with the Action Alternative under wet conditions were considered insignificant from both the overall and most affected sector perspectives.

Table 12 reports the effects of the Action Alternative under dry conditions. The overall change in Action Alternative total output, employment, and income compared to No Action wet conditions was again positive but very small, reflecting less than a 1% change. Looking at the sum of the eight most directly affected sectors, the gains were slightly higher in percentage terms indicating about a 3.5% change. The largest percentage change occurred in the automotive rental and leasing, hotel and lodging places, and the amusement and recreation services sectors. The hotel and lodging places sector is relatively large compared to the other two sectors. These gains in economic activity associated with the Action Alternative under dry conditions were considered insignificant from both the overall and most affected sector perspectives.

While the lack of expenditure data by county precluded county specific analyses, it is possible that certain impacts could be centered within certain counties. For example, negative impacts estimated for the amusement and recreation services sector under the Action Alternative during wet and dry conditions, stem from losses in guide boat fishing services expenditures which appear to be centered in and around the town of Dutch John in Daggett County. This loss of jobs during wet and dry conditions, while not overly apparent from a three-county perspective, could be more detrimental from the perspective of Daggett County alone and Dutch John in particular.

Table 10: Action Alternative Average Condition		Data Year: 1999				(Impact Area Counties: Daggett and Uintah, Utah, Sweetwater, Wyoming)			
Primary Industries/Sectors	IMPLAN Industry Number	Total Industry Output		Employment		Labor Income			
		Total (\$M)	Change from No Action \$M	Total (Jobs)	Change from No Action Jobs	Total (\$M)	Change from No Action \$M		
			Percent		Percent		Percent		
Agriculture, Forestry, Fishing	1-27	50.8	.0058	0.0	0	0	.0021	0.0	
Mining	28-47, 57	1349.8	.0185	0.0	4146	0	.0039	0.0	
Construction	48-56	335.7	.0538	0.0	3213	1	.0257	0.0	
Manufacturing	58-432	322.2	.0273	0.0	1729	0	.0052	0.0	
Other Transportation	433-436, 438-440	472.1	.0744	0.0	2902	1	.0266	0.0	
- Air Transportation:	437	6.4	.0353	0.6	74	0	.0151	0.6	
Communications	441-442	46.0	.0623	0.1	195	0	.0151	0.1	
Utilities	443-446	285.5	.0848	0.0	626	0	.0158	0.0	
Wholesale Trade	447	89.5	.0570	0.1	1076	1	.0235	0.1	
Other Retail Trade	448-449, 452-453	53.0	.0343	0.1	1583	1	.0165	0.1	
- Food Stores:	450	33.7	.3547	1.1	923	10	.2085	1.1	
- Automotive Dealers & Service Stations:	451	57.2	.3713	0.7	1111	7	.1692	0.7	
- Eating & Drinking:	454	70.0	.9469	1.4	2414	33	.3219	1.4	
- Miscellaneous Retail:	455	17.7	.1414	0.8	952	8	.0700	0.8	
Finance, Insurance, & Real Estate (FIRE)	456-462	207.1	.240	0.1	1779	3	.0320	0.1	
Other Services	464-476, 478-487, 489-509	346.7	.2458	0.1	6913	6	.1155	0.1	
- Hotels and Lodging Places:	463	40.7	1.303	3.3	11132	36	.5181	3.3	
- Automobile Rental and Leasing:	477	.55	.0792	16.8	16	2	.0229	16.8	
- Amusement and Recreation Services:	488	4.0	.2212	5.9	187	10	.0945	5.9	
Federal, State, and Local Government	510-515, 519-523	261.9	.0428	0.0	6660	0	.0146	0.0	
TOTAL:		4014.6	5.72	0.1	38853	120	1.7173	0.1	
MOST AFFECTED SECTORS:		230.3	3.45	1.5	6810	107	1.4	1.5	

Table 11: Action Alternative Wet Condition		Data Year: 1999										(Impact Area Counties: Daggett and Uintah, Utah, Sweetwater, Wyoming)			
		IMPLAN Industry Number		Total Industry Output				Employment				Labor Income			
Primary Industries/Sectors		Total (\$M)	Change from No Action		Total (Jobs)	Change from No Action		Total (\$M)	Change from No Action		Total (\$M)	Change from No Action			
			\$M	Percent		Jobs	Percent		\$M	Percent					
Agriculture, Forestry, Fishing	1-27	50.8	.0098	0.0	1340	0	0	15.9	.0035	0.0					
Mining	28-47, 57	1349.7	.0299	0.0	4146	0	0	283.9	.0064	0.0					
Construction	48-56	335.6	.0933	0.0	3211	1	0.0	111.3	.0441	0.0					
Manufacturing	58-432	322.1	.0466	0.0	1729	0	0	85.5	.0087	0.0					
Other Transportation	433-436, 438-440	471.9	.1217	0.0	2900	2	0.1	187.5	.0426	0.0					
- Air Transportation:	437	6.3	-.0465	-0.7	73	-1	-0.7	2.7	-.0199	-0.7					
Communications	441-442	45.8	.1086	0.2	194	1	0.3	11.1	.0263	0.2					
Utilities	443-446	285.4	.1505	0.1	625	0	0	45.4	.0279	0.1					
Wholesale Trade	447	89.4	.1008	0.1	1075	1	0.1	36.9	.0416	0.1					
Other Retail Trade	448-449, 452-453	53.0	.0624	0.1	1581	2	0.1	25.8	.0301	0.1					
- Food Stores:	450	33.2	.9785	3.0	909	27	3.0	19.5	.5752	3.0					
- Automotive Dealers & Service Stations:	451	56.8	1.337	2.4	1102	26	2.4	25.9	.6092	2.4					
- Eating & Drinking:	454	68.3	1.846	2.8	2356	64	2.8	23.2	.6275	2.8					
- Miscellaneous Retail:	455	17.5	.3703	2.2	941	20	2.2	8.6	.1832	2.2					
Finance, Insurance, & Real Estate (FIRE)	456-462	206.6	.4156	0.2	1773	5	0.3	27.2	.0541	0.2					
Other Services	464-476, 478-487, 489-509	346.2	.4243	0.1	6901	10	0.1	152.2	.1980	0.1					
- Hotels and Lodging Places:	463	38.2	2.097	5.8	1062	58	5.8	15.2	.8336	5.8					
- Automobile Rental and Leasing:	477	.3	-.1360	-31.3	9	-4	-31.3	.1	-.0393	-31.3					
- Amusement and Recreation Services:	488	2.9	-.2642	-8.3	137	-12	-8.3	1.2	-.1129	-8.3					
Federal, State, and Local Government	510-515, 519-523	261.8	.0797	0.0	6659	1	0	207.2	.0266	0.0					
TOTAL:		4001.8	8.15	0.2	38724	201	0.5	1286.5	3.1678	0.2					
MOST AFFECTED SECTORS:		223.5	6.2	2.8	6588	178	2.8	96.5	2.7	2.8					

Table 12: Action Alternative Dry Condition		Data Year: 1999										(Impact Area Counties: Daggett and Uintah, Utah, Sweetwater, Wyoming)					
		IMPLAN Industry Number		Total Industry Output		Employment		Labor Income		Total Industry Output		Employment		Labor Income			
Primary Industries/Sectors		Total (\$M)	Change from No Action \$M	Percent	Total (Jobs)	Change from No Action Jobs	Percent	Total (\$M)	Change from No Action \$M	Percent	Total (Jobs)	Change from No Action Jobs	Percent	Total (\$M)	Change from No Action \$M	Percent	
																	Agriculture, Forestry, Fishing
Mining	28-47, 57	1,349.6	.0362	0.0	4,146	0	0	283.9	.0077	0.0							
Construction	48-56	335.3	.1102	0.0	3,208	2	0.1	111.2	.0523	0.1							
Manufacturing	58-432	322.0	.0551	0.0	1,728	1	0.0	85.4	.0104	0.0							
Other Transportation	433-436, 438-440	471.6	.1471	0.0	2,896	2	0.1	187.4	.0519	0.0							
- Air Transportation:	437	6.3	-.0122	-0.2	72	0	0	2.7	-.0052	-0.2							
Communications	441-442	45.5	.1277	0.1	193	1	0.3	11.1	.0309	0.3							
Utilities	443-446	285.0	.1765	0.1	624	1	0.1	45.4	.0328	0.1							
Wholesale Trade	447	89.1	.1184	0.1	1,072	1	0.1	36.8	.0489	0.1							
Other Retail Trade	448-449, 452-453	52.8	.0725	0.1	1,576	2	0.1	25.8	.0349	0.1							
- Food Stores:	450	31.5	1.0228	3.4	861	28	3.4	18.5	.6012	3.4							
- Automotive Dealers & Service Stations:	451	54.8	1.3160	2.5	1,063	26	2.5	25.0	.5995	2.5							
- Eating & Drinking:	454	64.1	2.1127	3.4	2,212	73	3.4	21.8	.7182	3.4							
- Miscellaneous Retail:	455	16.8	.3922	2.4	904	21	2.4	8.3	.1940	2.4							
Finance, Insurance, & Real Estate (FIRE)	456-462	205.5	.4913	0.2	1,760	6	0.3	27.1	.0646	0.2							
Other Services	464-476, 478-487, 489-509	345.1	.5011	0.1	6,875	12	0.2	151.7	.2343	0.2							
- Hotels and Lodging Places:	463	32.7	2.5646	8.5	909	71	8.5	13.0	1.0197	8.5							
- Automobile Rental and Leasing:	477	.1	-.0523	-30.5	3	-2	-30.5	0	-.0151	-30.5							
- Amusement and Recreation Services:	488	1.8	-.1192	-6.2	85	-6	-6.2	.8	-.0510	-6.2							
Federal, State, and Local Government	510-515, 519-523	261.6	.0921	0.0	6,658	1	0.0	207.1	.0309	0.0							
TOTAL:		3,976.6	10,2278	0.3	38,185	240	0.6	1278.8	3,6666	0.3							
MOST AFFECTED SECTORS:		208.1	7.2	3.6	6,111	212	3.6	90.0	3.06	3.5							

3.3 Commercial Operator Surveys

In addition to the recreator surveys described previously under the recreation section, surveys of both Green River and Flaming Gorge Reservoir commercial operators were also conducted during the summer of 2001 to try and identify anticipated adverse impacts not discernable from the three-county oriented regional analysis. Commercial operations on the Green River include rafting/scenic floating and boat fishing guides. Commercial operations on Flaming Gorge Reservoir include fishing guides and marinas.

The survey response rate was fairly good overall, especially for the Green River operators. Of the 12 river commercial operators, 10 returned surveys. The two that didn't respond were small operators. As a result, the responses provided for the river are assumed to represent a census. On the reservoir, five of the nine boat guides and two of the three marinas provided responses. While not indicative of a census, the reservoir response rate was considered sufficiently representative to present the survey results.

Despite the reasonable response rates, the survey data did not provide enough information to estimate impacts by alternative since not all the respondents answered all the questions. While it would have been useful to separately identify impacts to commercial operations on both the river and reservoir, it should be noted that the regional modeling analysis incorporates (but does not strictly identify) most of the impacts to the commercial operators by addressing changes in visitation and recreation expenditures (including guide fees and marina rentals). As a result, if estimation of direct impacts to commercial operators had been possible from the survey, it would have been inappropriate to add them to the impacts already estimated via the regional model since that would have implied double counting. The difficulty with the regional modeling results are that they are aggregated by economic sector and industry and do not provide detailed impacts for specific businesses.

For both the river and reservoir, the surveys did provide some useful commercial operator information by recreation activity in terms of: 1) average visitation and revenue, 2) high end, low end, and preferred flows/water levels, and 3) preferred flow/water level visitation and revenue. The site and activity specific high end, low end, and preferred flow/water level information was compared to average flow/end of month water level information for each alternative under average, wet, and dry conditions for the months from March to October to try and evaluate alternative preferences (see tables 13 and 14).

In addition, assuming historical averages for visitation and revenue reflect No Action average conditions, the additional visitation and revenue under preferred conditions may provide an indicator of possible impacts under average conditions. In the typical case where Action Alternative flows/water levels are closer to preferred flows/water levels than No Action flows/water levels, the difference between average historical/No Action conditions and preferred conditions presented below could be used to as an upper bound on possible Action Alternative visitation and revenue impacts. The further away Action Alternative flows/water levels fall from preferred flows, the lower the impact. In cases where No Action Alternative flows/water levels are closer to preferred flows/water levels, the visitation and revenue impacts presented below would not reflect an upper bound.

In table 13, for Green River scenic floating operations, the survey indicated that preferred flows for reach 1 from the dam to the confluence of the Yampa River averaged 4,040 cubic feet per second (cfs) with a range from 2,000 to 10,000 cfs. High end and low end thresholds, depicting the points where flows are either too high or too low for rafting, averaged 15,200 and 715 cfs, respectively.

Table 14: Flaming Gorge Reservoir Commercial Operator Hydrology Comparisons																							
Recreation Activity	Flow Levels	Month	Average Conditions						Wet Conditions						Dry Conditions								
			No Action Flow	Beyond Usable Range?	Action Flow	Closest to Preferred Flow	Beyond Usable Range?	Action Flow	No Action Flow	Closest to Preferred Flow	Beyond Usable Range?	Action Flow	Closest to Preferred Flow	Beyond Usable Range?	Action Flow	No Action Flow	Closest to Preferred Flow	Beyond Usable Range?	Action Flow	Closest to Preferred Flow	Beyond Usable Range?	Action Flow	
Boat Fishing	Preferred: 6,029	Mar	6,024.0	No	6,025.8	Action	6,027.9	No	6,027.9	Action	6,027.9	No	6,027.9	Same	6,019.0	No	6,023.5	Action	6,019.0	No	6,023.5	Action	
	High End: 6,040	Apr	6,024.1	No	6,026.0	Action	6,028.5	No	6,028.5	Action	6,028.5	No	6,028.5	Same	6,020.1	No	6,023.0	Action	6,020.1	No	6,023.0	Action	
	Low End: 6,006	May	6,023.8	No	6,025.8	Action	6,029.4	No	6,029.4	Action	6,029.2	No	6,029.2	Action	6,017.6	No	6,022.8	Action	6,017.6	No	6,022.8	Action	
		June	6,026.6	No	6,027.8	Action	6,031.7	No	6,030.3	Action	6,030.3	No	6,030.3	Action	6,018.5	No	6,024.5	Action	6,018.5	No	6,024.5	Action	
		July	6,029.1	No	6,029.2	No Action	6,035.5	No	6,030.7	Action	6,030.7	No	6,030.7	Action	6,019.3	No	6,024.7	Action	6,019.3	No	6,024.7	Action	
		Aug	6,028.9	No	6,028.4	No Action	6,036.0	No	6,030.5	Action	6,030.5	No	6,030.5	Action	6,018.5	No	6,023.8	Action	6,018.5	No	6,023.8	Action	
		Sept	6,028.3	No	6,027.4	No Action	6,035.5	No	6,030.0	Action	6,030.0	No	6,030.0	Action	6,017.9	No	6,023.2	Action	6,017.9	No	6,023.2	Action	
		Oct	6,027.5	No	6,026.8	No Action	6,034.9	No	6,029.8	Action	6,029.8	No	6,029.8	Action	6,017.3	No	6,023.1	Action	6,017.3	No	6,023.1	Action	
						Overall: Action		Overall: Action		Overall: Action		Overall: Action		Overall: Action		Overall: Action		Overall: Action		Overall: Action		Overall: Action	
	Marinas	Preferred: 6,031	Mar	6,024.0	No	6,025.8	Action	6,027.9	No	6,027.9	Action	6,027.9	No	6,027.9	Same	6,019.0	Yes	6,023.5	Action	6,019.0	Yes	6,023.5	Action
High End: 6,035		Apr	6,024.1	No	6,028.0	Action	6,028.5	No	6,028.5	Action	6,028.5	No	6,028.5	Same	6,020.1	Yes	6,023.0	Action	6,020.1	Yes	6,023.0	Action	
Low End: 6,023		May	6,023.8	No	6,025.8	Action	6,029.4	No	6,029.2	Action	6,029.2	No	6,029.2	No Action	6,017.6	Yes	6,022.8	Range	6,017.6	Yes	6,022.8	Range	
		June	6,026.6	No	6,027.8	Action	6,031.7	No	6,030.3	Action	6,030.3	No	6,030.3	Same	6,018.5	Yes	6,024.5	Action	6,018.5	Yes	6,024.5	Action	
		July	6,029.1	No	6,029.2	Action	6,035.5	Yes	6,030.7	Action	6,030.7	No	6,030.7	Action	6,019.3	Yes	6,024.7	Action	6,019.3	Yes	6,024.7	Action	
		Aug	6,028.9	No	6,028.4	No Action	6,036.0	Yes	6,030.5	Action	6,030.5	No	6,030.5	Action	6,018.5	Yes	6,023.8	Action	6,018.5	Yes	6,023.8	Action	
		Sept	6,028.3	No	6,027.4	No Action	6,035.5	Yes	6,030.0	Action	6,030.0	No	6,030.0	Action	6,017.9	Yes	6,023.2	Action	6,017.9	Yes	6,023.2	Action	
		Oct	6,027.5	No	6,026.8	No Action	6,034.9	No	6,029.8	Action	6,029.8	No	6,029.8	Action	6,017.3	Yes	6,023.1	Action	6,017.3	Yes	6,023.1	Action	
						Overall: Action		Overall: Action		Overall: Action		Overall: Action		Overall: Action		Overall: Action		Overall: Action		Overall: Action		Overall: Action	

Comparing the high end/low end flow thresholds to average condition flows for both the No Action and Action Alternatives indicates that average flows for both alternatives for the March thru October months fall within the usable range. For each month, an evaluation was also made as to which alternative's flows were closer to the preferred flow (monthly comparison). Of the 8 months studied, 4 months resulted in the Action Alternative being preferred and 4 months resulted in the No Action being preferred. Finally, differences between the preferred flow level and both No Action and Action Alternative flows were calculated for each month. The absolute value of these differences was summed, and the alternative with the lowest total difference was considered preferred (seasonal comparison). The Action Alternative was judged to be preferred by commercial rafters based on this seasonal comparison.

The Action Alternative was deemed to be preferred by commercial rafting operators under wet conditions. Both alternatives fell within the usable flow ranges for all months. The results suggest the Action Alternative would be preferred under wet conditions based on both the overall seasonal flow difference as well as 6 of the 8 months studied.

Conversely, the No Action Alternative would appear to be preferred by commercial rafting operators under dry conditions. Both alternatives fell within the usable flow ranges for all months. It appears the No Action Alternative would be preferred based both on the overall seasonal flow difference as well as 4 of the 6 months studied (note that the difference from the preferred flow was the same for 2 months for both alternatives).

Rafting operators indicated an average of 40 boat trips a year with a range from 10 to 90. Note that boat trips would include multiple rafters and perhaps multiple days. Average annual revenues were estimated at about \$235,000 with a range from \$35,000 to \$476,000. Average additional annual trips under preferred flows were estimated at about 17 trips with a range from zero to 54. Some operators noted that visitation is controlled within Dinosaur National Monument such that number of trips could not increase under preferred flows, but number of clients per trip could increase. Average additional annual revenues under preferred flows were estimated at about \$39,000 (+16.6%) with a range from \$0 to \$90,000.

For Green River boat fishing operations, in table 13, the surveys suggest that preferred flows for the portion Reach 1 associated with boat fishing (from the dam to the Utah/Colorado State line) averaged 2,338 cfs with a range from 1,400 to 2,800 cfs. High and low end thresholds for boat fishing averaged 7,530 and 1,030 cfs, respectively. Based on comments from the Green River Outfitter and Guides Association, the low end threshold was further reduced to 800 cfs.

The Action Alternative was deemed to be preferred by commercial boat fishing operators on the Green River under average conditions based on comparisons to preferred flows since both alternatives fell within the usable range across all months. The comparisons to preferred flows resulted in the Action Alternative being preferred based on the overall seasonal flow difference. Individual monthly comparisons resulted in no obvious preference since 4 of the 8 months went to each alternative, although the lower use months of March and October showed a preference for the No Action implying the higher use months of April through September preferred the Action Alternative.

The No Action Alternative was deemed to be preferred by commercial boat fishing operators under wet conditions. Both alternatives fell within the usable flow ranges for all months. The preferred flow comparisons resulted in the No Action Alternative being preferred based on the overall seasonal flow difference, but both alternatives appear to be equally attractive based on the monthly comparisons. Looking at the higher use months of April through September, the No Action Alternative would be preferred.

Similarly, the No Action Alternative would appear to be preferred by commercial boat fishing operators under dry conditions. While both alternatives fall within the usable range in all months, the No Action would be preferred based on comparisons to preferred flow. The No Action Alternative would be preferred in 4 of the 6 months with preferred flow based differences.

Two of the four boat fishing operators who responded to the survey question indicated an average of 210 boat trips a year. Average annual revenues across all four operators were estimated at about \$245,600 with a range from \$32,000 to \$500,000. Average additional annual trips under preferred flows was estimated at about 54 trips with a range from 23 to 108. Average additional annual revenues under preferred flows was estimated at about \$17,000 (+6.9%) with a range from \$7,200 to \$35,000.

In table 14, for Flaming Gorge Reservoir boat fishing operations, preferred water levels averaged 6029 feet above mean sea level. High and low end thresholds averaged 6040 and 6006, respectively.

The Action Alternative was deemed to be preferred by commercial boat fishing operators on Flaming Gorge Reservoir under average conditions. Both alternatives fell within the usable water level ranges for all months. The comparisons to preferred water levels resulted in the Action Alternative being preferred based on the overall seasonal water level difference and in 4 of 8 monthly comparisons.

The Action Alternative was deemed to be preferred by commercial boat fishing operators under wet conditions. Both alternatives fell within the usable water level ranges for all months. The comparisons resulted in the Action Alternative being preferred based on the overall seasonal water level difference and in 6 of 6 months (note that 2 months resulted in the same water level differential for both alternatives).

The Action Alternative would appear to be preferred by commercial boat fishing operators under dry conditions. Both alternatives fell within the usable water level ranges for all months. The Action Alternative would be preferred based on both the overall seasonal water level difference and the monthly comparisons for all months studied.

Reservoir boat fishing operators indicated an average of 107 clients a year with a range from 20 to 220. Average annual revenues were estimated at about \$12,800 with a range from \$4,000 to \$38,000. Average additional annual trips under preferred water levels was estimated at 5 trips with a range from zero to 18. Average additional annual revenues under preferred water levels were estimated at only \$650 (5.1%) with a range from \$0 to \$2,250.

For Flaming Gorge Reservoir marina operations, table 14 indicates preferred water levels across all boat based activities averaged 6031 feet with a range from 6030 to 6035 depending on activity. High and low end thresholds averaged 6035 and 6023, respectively.

The Action Alternative was deemed to be preferred by commercial boat fishing operators on Flaming Gorge Reservoir under average conditions. Both alternatives fell within the usable water level ranges for all months. The comparisons to preferred water levels resulted in the Action Alternative being preferred based on the overall seasonal water level difference and in 5 of 8 monthly comparisons.

The Action Alternative was deemed to be preferred by commercial boat fishing operators under wet conditions. No Action water levels for July through September were the only months to fall outside the usable range. The comparisons resulted in the Action Alternative being preferred

based on the overall seasonal water level difference and in 4 of 5 months (note that 3 months resulted in the same water level differential for both alternatives).

The Action Alternative would appear to be preferred by commercial boat fishing operators under dry conditions. This is primarily because the No Action Alternative falls outside the usable water level range in all months compared to only 1 month (May) for the Action Alternative.

Marina operators responded with an average of 97,200 clients a year. Average annual revenues were estimated at about \$915,800. Average additional annual trips under preferred water levels was estimated at 10,600 trips. Average additional annual revenues under preferred water levels were estimated at \$225,400 (+24.6%). These additional revenues include cost savings associated with reduced operation and maintenance (O&M) related to moving and shoring up docks, moorings, etc. under preferred water levels. In general, the cost of operating and maintaining marinas, boat ramps, and boat camps increases as water levels drop below preferred water levels. The annual O&M costs savings under preferred conditions at the two marinas averaged \$46,000.

Comparing the high and low end thresholds provided by the commercial operators to those from the recreator surveys for the same recreation activity indicates that generally speaking the commercial operators were willing to pursue visits over a wider range of flows/water levels. In other words, the high end thresholds were higher and the low end thresholds were lower for the commercial operators. The preferred flows/water levels for the commercial operators were higher than those from the recreator surveys.

4.0 BIBLIOGRAPHY

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