Revised Estimates for Direct-Effect Recreational Jobs in the Interior Columbia River Basin

Lisa K. Crone and Richard W. Haynes
Authors

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Interior Columbia Basin Ecosystem Management Project: Scientific Assessment

Thomas M. Quigley, Editor

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Preface

The Interior Columbia Basin Ecosystem Management Project was initiated by the Forest Service and the Bureau of Land Management to respond to several critical issues including, but not limited to, forest and rangeland health, anadromous fish concerns, terrestrial species viability concerns, and the recent decline in traditional commodity flows. The charter given to the project was to develop a scientifically sound, ecosystem-based strategy for managing the lands of the Interior Columbia River basin administered by the Forest Service and the Bureau of Land Management. The Science Integration Team was organized to develop a framework for ecosystem management, an assessment of the socioeconomic and biophysical systems in the basin, and an evaluation of alternative management strategies. This paper is one in a series of papers developed as background material for the framework, assessment, or evaluation of alternatives. It provides more detail than was possible to disclose directly in the primary documents.

The Science Integration Team, although organized functionally, worked hard at integrating the approaches, analyzes, and conclusions. It is the collective effort of team members that provides depth and understanding to the work of the project. The Science Integration Team leadership included deputy team leaders Russel Graham and Sylvia Arbelbide; landscape ecology—Wendel Hann, Paul Hessburg, and Mark Jensen; aquatic—Jim Sedell, Kris Lee, Danny Lee, Jack Williams, and Lynn Decker; economic—Richard Haynes, Amy Horne, and Nick Reyna; social science—Jim Burchfield, Steve McCool, Jon Bumstead; and Stewart Allen; terrestrial—Bruce Marcot, Kurt Nelson, John Lehmkuhl, Richard Holthausen, Randy Hickenbottom, Marty Raphael, and Michael Wisdom; spatial analysis—Becky Gravenmier, John Steffenson, and Andy Wilson.

Thomas M. Quigley
Editor
Abstract


This paper reviews the methodology used to derive the original estimates for direct employment associated with recreation on Federal lands in the interior Columbia River basin (the basin), and details the changes in methodology and data used to derive new estimates. The new analysis resulted in an estimate of 77,655 direct-effect jobs associated with recreational activities on Federal lands in the basin. This estimate is a little over one-third of the previous estimate. The new estimated direct-effect recreational jobs amount to 4.48 percent of the total estimated jobs in the basin in 1994. This is still slightly larger than the estimated percentage of jobs in ranching, mining, and lumber and wood products combined (3.52 percent) in the basin. The intent of the original analysis is clarified, limitations of the data are brought forward, a cross-sectional analysis is conducted, and suggestions for future research are provided.

Keywords: Recreation, employment, Columbia River basin.
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Introduction

In the economics component of the assessment of ecosystem components (referred to as the “economics assessment;” Haynes and Horne 1997), estimates of the number of jobs directly associated with recreation on Federal lands in the interior Columbia River basin (the basin) and Bureau of Economic Analysis (BEA) functional economic areas (described below) are reported. Many readers of the economics assessment and the draft environmental impact statements (USDA and USDI 1997a, 1997b) felt that the estimates were too high. To address these concerns, a review of the methodology and data used in the analysis was conducted. Based on this review, two steps were taken to improve the estimates: the first was to use a more direct method to allocate recreational visits geographically, and the second was to use more representative expenditure estimates. This paper presents new direct job estimates based on the revised expenditure estimates and the new method of allocating recreational visits to BEA areas. We begin with a review of the recreational use data and outline the original and new methodology used to spatially allocate the recreational activity. The new expenditure estimates, their sources, and their differences from the original estimates are then presented. Next, we provide a brief overview of what a recreation-response multiplier is, what it measures, and how it is calculated, followed by the original and new estimated direct-effect employment recreation-response multipliers. The intent of the original analysis is clarified and limitations of the data are discussed. The new direct employment estimates are then displayed and analyzed, including a discussion of the sources for differences between the original and new direct employment estimates and an analysis of sources of variation in the new estimates across the BEA areas in the basin. Finally, we offer suggestions for future research.

The methods used for the computation of jobs have been used in past studies of the economic contribution of selected sets of recreational activities (see for example Haynes and others 1992). What differs here is that the selected set of recreational activities are broader than those used in most previous studies. Twelve activities considered representative of the types of recreational activities that occur on Federal lands in the basin were used in this study.

Recreational Visits and Their Geographic Distribution

To estimate the amount of direct employment associated with recreational activity on Federal lands in the interior Columbia River basin, information on recreational use had to be gathered by the project staff. The recreational use estimates were obtained by contractors who contacted every national forest, Bureau of Land Management (BLM) district, national park, and national wildlife refuge site in the project area. For ease, these are referred to as “management units” in this paper. Seventy-five percent of the management units solicited in the project area provided data on estimated use for this study. The management units that did not respond were given null values for visits.

The information was standardized and compiled, and the average of the reported use data for 1991, 1992, and 1993 was calculated. This averaging was done to decrease the bias of using a single year when lower or higher use levels might have occurred owing to external influences, such as weather conditions or gas prices. The data were

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2 These units were given null values because we had no way of estimating their use levels with any degree of accuracy. All tables and analyses were based only on data from the units that reported their recreational use.
summarized as the number of visits at each of the management units for each of 12 recreational activities. A visit was defined as an excursion by one individual to a recreation area for the purpose of participating in one or more recreational activities for any length of time. Only the primary activity for the visitor was recorded. The 12 recreational activities measured were camping, day use, fishing, hunting, motorized boating, motorized viewing, nonmotorized boating, off-highway vehicle (OHV) use, snowmobiling, trail use, viewing wildlife, and winter sports.

In the new analysis, adjustments were made to the visitation data for one management unit, the National Bison Range, where it was apparent that visits were being double counted into more than one activity category. A few other minor data errors also were corrected.

Original Methodology for ERU Areas

In the original design of the assessment process, the Science Integration Team divided the basin into 13 geographic areas called ecological reporting units (ERUs) as shown in figure 1. The ERUs were developed by the aquatic, landscape ecology, and terrestrial staff to facilitate the analysis and presentation of information and results on areas smaller than the entire basin. These ERUs are regions in which lands have similar capacities to produce various ecosystem goods, functions, and conditions. As part of the integrative approach, the original recreation methodology focused on determining the amount of estimated recreational activity occurring in each ERU. The percentage of each management unit in each ERU was obtained.
### Table 1—Regional economies of the interior Columbia basin, by BEA<sup>a</sup> area

<table>
<thead>
<tr>
<th>Area</th>
<th>BEA area</th>
<th>Coverage of BEA area&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Counties included</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boise</td>
<td>Boise</td>
<td>Full</td>
<td>OR: Harney, Malheur ID: Ada, Adams, Boise, Canyon, Elmore, Owyhee, Payette, Valley, Washington</td>
</tr>
<tr>
<td>Butte</td>
<td>Butte</td>
<td>Partial</td>
<td>MT: Deer Lodge, Granite, Lewis and Clark, Powell, Silverbow</td>
</tr>
<tr>
<td>Idaho Falls</td>
<td>Idaho Falls</td>
<td>Full plus</td>
<td>ID: Bannock, Bingham, part of Bonneville, Butte, Caribou, Clark, Custer, Fremont, Jefferson, Lemhi, Madison, Power, Teton WY: Teton</td>
</tr>
<tr>
<td>Missoula</td>
<td>Missoula</td>
<td>Full</td>
<td>MT: Flathead, Lake, Lincoln, Mineral, Missoula, Ravalli, Sanders</td>
</tr>
<tr>
<td>Bend-Redmond</td>
<td>Portland-Salem</td>
<td>Partial</td>
<td>WA: Klickitat, Skamania OR: Crook, Deschutes, Hood River, Jefferson, Klamath, Lake, Sherman, Wasco</td>
</tr>
<tr>
<td>Tri-Cities</td>
<td>Richland-Kennewick-Pasco</td>
<td>Full</td>
<td>WA: Adams, Benton, Chelan, Douglas, Franklin, Grant, Yakima, Kittitas, Okanogan</td>
</tr>
<tr>
<td>Twin Falls</td>
<td>Twin Falls</td>
<td>Full</td>
<td>ID: Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, Twin Falls</td>
</tr>
</tbody>
</table>

<sup>a</sup> BEA = Bureau of Economic Analysis.  
<sup>b</sup> Full = regional economy includes all the counties in the BEA area; partial = regional economy does not include every county in the BEA area; full plus = regional economy includes all counties within the BEA area and additional counties.

From the Project Spatial Team. The assumption made was that activities were evenly distributed across each management unit. Thus, for example, camping visits to the Deschutes National Forest, which were estimated to be 362,557, were allocated as follows:

\[
\text{ERU2} = 0.76573 \times 362,557 = 277,621 \\
\text{ERU3} = 0.00018 \times 362,557 = 65 \\
\text{ERU4} = 0.1241 \times 362,557 = 44,993 \\
\text{ERU5} = 0.10999 \times 362,557 = 39,878
\]
Visits in each ERU were then summed across all management units having some portion of their land base within that ERU.

In the economics assessment, economic activities were geographically described by using the BEA definition of functional economies. A functional economy is one large enough to include the bulk of economic transactions or flows of trade. The BEA defined functional economic units by identifying economic nodes and the surrounding counties economically linked to them. For this analysis, the BEA areas were modified to include only those counties fully or partially contained within the basin. Table 1 describes the extent of each regional economy and compares regional definitions used in this study to the BEA functional economic areas (U.S. Department of Commerce 1995). A map of the basin and BEA areas is shown in figure 2.

Visits by ERU were converted into visits by BEA area. To do this, conversion factors were obtained from the Project Spatial Team to show the percentage of Forest Service- and BLM-administered lands in each ERU that lies in each BEA area. Again the assumption was made that recreational activity was evenly distributed across the Forest Service- and BLM-administered lands within each ERU. For example, in the Southern Cascades ERU (2), 0.0032 of the activity was assumed to occur in BEA 1 (Tri-Cities), and 0.9968 in BEA 8 (Bend-Redmond).

Figure 2—Interior Columbia River basin and Bureau of Economic Analysis areas. Source: Interior Columbia Basin Ecosystem Management Project GIS staff.

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4 For a detailed description of the methodology used by the BEA to delineate these areas, see Johnson (1995). In 1995, the BEA areas were redefined based mainly on new information on commuting patterns. This resulted in the aggregation of the Butte BEA area into the Missoula BEA area. Because the data reported in the economic assessment were based on the previous area definitions, those area definitions were maintained here for consistency.
New Methodology for ERU Areas

Recreational activity for each land management unit again was assumed to be evenly distributed across that unit. The percentage of the management unit in each county was calculated, and that percentage was used to distribute the management unit’s recreational visits to each county. These visits then were allocated to the BEA area of which the county was a part. The percentages used to allocate management unit visits to BEA area visits are shown in table 2. The original and new estimated recreational visits to Federal lands for the basin and BEA areas are shown in tables 3 and 4, respectively.\(^5\)

Original Methodology for BEA Areas

In the original analysis, visits were converted into days\(^6\) to be compatible with the direct-effect recreation-response multipliers, which were measured as jobs per thousand days of recreational activity. To convert to days, visits were multiplied by the average length of stay (in days) for each activity. The estimates of average length of stay are presented in table 5. As an example, for camping, one visit would represent an average of 3.71 days. Thus, in the Boise BEA area, which had 893,212 camping visits per year, the conversion to days is:

\[
\text{Days} = 893,212 \text{ visits} \times (3.71 \text{ days per visit}) = 3,313,816 \text{ days}.
\]

New Methodology for BEA Areas

The new expenditure estimates for nine activities (hunting, fishing, and wildlife viewing excluded\(^7\)) were measured as spending per person per trip. We assumed that a trip was the same as a visit and thus eliminated the need to use estimates of average length of stay for these nine activities. The new direct-effect recreation-response multipliers were measured in jobs per thousand recreational visits. The procedure used to convert the response multipliers for hunting, fishing, and wildlife viewing from jobs per thousand days to jobs per thousand visits is discussed in the following section.

Expenditure Estimates

The original expenditure estimates were derived from only the CUSTOMER and PARVS surveys\(^8\) conducted within the basin. Due to small sample sizes or location-specific samples, or both, the representativeness of these estimates has been questioned. The new expenditure estimates for nine of the activities (hunting, fishing, and wildlife viewing excepted) came from CUSTOMER and PARVS expenditure data from Forest Service sites across the country. The assumption made here is that expenditures by recreationists at sites outside the project area are similar to expenditures by recreationists at sites within the project area. These new expenditure estimates were provided for four broad activity types rather than for the nine specific activities listed above. The four activity groupings were camping and picnicking (includes camping and day use activities), trail use (includes trail use and nonmotorized boating), mechanized travel (includes motor

\(^\text{5}\) Total visits differ in the two tables because of the adjustments noted in footnote 3.

\(^\text{6}\) A day refers to a 24-hour period.

\(^\text{7}\) The 1991 national survey of fishing, hunting and wildlife-associated recreation (USDI 1993) estimates were used for these activities because these estimates were derived from a sampling technique and statistical methodology that was applied consistently across the lands in the basin.

\(^\text{8}\) CUSTOMER is an acronym that stands for customer use and survey techniques for operations, management evaluation, and research. PARVS is an acronym that stands for public area recreation visitors survey. Details on the survey techniques and data sets may be obtained from: USDA Forest Service Outdoor Recreation and Wilderness Research Group, 320 Green St. Athens, GA 30602-2044.
Table 2—Percentages used to allocate management unit visits to BEA\textsuperscript{a} areas by management unit

<table>
<thead>
<tr>
<th>Management unit</th>
<th>BEA allocation by BEA area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td></td>
</tr>
<tr>
<td>National Forest System:</td>
<td></td>
</tr>
<tr>
<td>Deschutes</td>
<td>100 Bend-Redmond</td>
</tr>
<tr>
<td>Fremont</td>
<td>100 Bend-Redmond</td>
</tr>
<tr>
<td>Malheur</td>
<td>80 Pendleton, 20 Boise</td>
</tr>
<tr>
<td>Mount Hood</td>
<td>100 Bend-Redmond</td>
</tr>
<tr>
<td>Ochoco</td>
<td>51 Bend-Redmond, 27 Boise, 22 Pendleton</td>
</tr>
<tr>
<td>Umatilla</td>
<td>90 Pendleton, 10 Spokane</td>
</tr>
<tr>
<td>Wallowa-Whitman</td>
<td>100 Pendleton</td>
</tr>
<tr>
<td>Colville</td>
<td>100 Spokane</td>
</tr>
<tr>
<td>Gifford Pinchot</td>
<td>100 Bend-Redmond</td>
</tr>
<tr>
<td>Okanogan</td>
<td>100 Tri-Cities</td>
</tr>
<tr>
<td>Wenatchee</td>
<td>100 Tri-Cities</td>
</tr>
<tr>
<td>Winema</td>
<td>100 Bend-Redmond</td>
</tr>
<tr>
<td>Boise</td>
<td>100 Boise</td>
</tr>
<tr>
<td>Caribou</td>
<td>100 Idaho Falls</td>
</tr>
<tr>
<td>Challis</td>
<td>100 Idaho Falls</td>
</tr>
<tr>
<td>Clearwater</td>
<td>100 Spokane</td>
</tr>
<tr>
<td>Idaho Panhandle</td>
<td>86 Spokane, 14 Missoula</td>
</tr>
<tr>
<td>Nez Perce</td>
<td>100 Spokane</td>
</tr>
<tr>
<td>Payette</td>
<td>65 Boise, 35 Spokane</td>
</tr>
<tr>
<td>Salmon</td>
<td>92 Idaho Falls, 4 Boise, 4 Spokane</td>
</tr>
<tr>
<td>Sawtooth</td>
<td>76 Twin Falls, 16 Idaho Falls, 8 Boise</td>
</tr>
<tr>
<td>Targhee</td>
<td>100 Idaho Falls</td>
</tr>
<tr>
<td>Bitteroot</td>
<td>70 Missoula, 30 Spokane</td>
</tr>
<tr>
<td>Deerlodge</td>
<td>100 Butte</td>
</tr>
<tr>
<td>Flathead</td>
<td>90 Missoula, 10 Butte</td>
</tr>
<tr>
<td>Helena</td>
<td>100 Butte</td>
</tr>
<tr>
<td>Kootenai</td>
<td>97.5 Missoula, 2.5 Spokane</td>
</tr>
<tr>
<td>Lolo</td>
<td>80 Missoula, 20 Butte</td>
</tr>
<tr>
<td>Humboldt</td>
<td>100 Boise</td>
</tr>
<tr>
<td>Bridger-Teton</td>
<td>100 Idaho Falls</td>
</tr>
<tr>
<td>BLM\textsuperscript{b} districts:</td>
<td></td>
</tr>
<tr>
<td>Burns</td>
<td>97.1 Boise, 2.7 Bend-Redmond, 0.2 Pendleton</td>
</tr>
<tr>
<td>Lakeview</td>
<td>79 Bend-Redmond, 21 Boise</td>
</tr>
<tr>
<td>Prineville</td>
<td>80 Bend-Redmond, 20 Pendleton</td>
</tr>
<tr>
<td>Vale</td>
<td>91.4 Boise, 8.4 Pendleton, 0.2 Spokane</td>
</tr>
<tr>
<td>Spokane</td>
<td>78 Tri-Cities, 17 Spokane, 5 Bend-Redmond, 80 Pendleton, 20 Pendleton</td>
</tr>
<tr>
<td>Boise</td>
<td>100 Boise</td>
</tr>
<tr>
<td>Burley</td>
<td>100 Twin Falls</td>
</tr>
<tr>
<td>Coeur d’Alene</td>
<td>100 Spokane</td>
</tr>
<tr>
<td>Management unit</td>
<td>BEA allocation by BEA area</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>Idaho Falls</td>
<td>100 Idaho Falls</td>
</tr>
<tr>
<td>Salmon</td>
<td>100 Idaho Falls</td>
</tr>
<tr>
<td>Shoshone</td>
<td>100 Twin Falls</td>
</tr>
<tr>
<td>Garnet</td>
<td>91 Butte, 9 Missoula</td>
</tr>
<tr>
<td>Nevada, all</td>
<td>65 Boise, 35 Twin Falls</td>
</tr>
<tr>
<td>National Park Service:</td>
<td></td>
</tr>
<tr>
<td>Crater Lake</td>
<td>100 Bend-Redmond</td>
</tr>
<tr>
<td>John Day Fossil Beds</td>
<td>100 Pendleton</td>
</tr>
<tr>
<td>Lake Chelan and North Cascades</td>
<td>100 Tri-Cities</td>
</tr>
<tr>
<td>Coulee Dam</td>
<td>100 Spokane</td>
</tr>
<tr>
<td>Whitman Mission National Historic Site</td>
<td>100 Pendleton</td>
</tr>
<tr>
<td>City of Rocks</td>
<td>100 Twin Falls</td>
</tr>
<tr>
<td>Craters of the Moon</td>
<td>75 Idaho Falls, 25 Twin Falls</td>
</tr>
<tr>
<td>Hagerman Fossil Beds</td>
<td>100 Twin Falls</td>
</tr>
<tr>
<td>Nez Perce National Historic Park</td>
<td>100 Spokane</td>
</tr>
<tr>
<td>Glacier</td>
<td>100 Missoula</td>
</tr>
<tr>
<td>Grant-Kohrs Ranch</td>
<td>100 Butte</td>
</tr>
<tr>
<td>Fish and Wildlife Service:</td>
<td></td>
</tr>
<tr>
<td>Klamath Basin</td>
<td>100 Bend-Redmond</td>
</tr>
<tr>
<td>Malheur NWRa</td>
<td>100 Boise</td>
</tr>
<tr>
<td>Columbia NWR</td>
<td>100 Tri-Cities</td>
</tr>
<tr>
<td>Conboy Lake</td>
<td>100 Bend-Redmond</td>
</tr>
<tr>
<td>Deer Flat NWR</td>
<td>100 Boise</td>
</tr>
<tr>
<td>Kootenai</td>
<td>100 Spokane</td>
</tr>
<tr>
<td>South East Idaho NWR Complex</td>
<td>66 Twin Falls, 34 Idaho Falls</td>
</tr>
<tr>
<td>Lee Metcalf NWR</td>
<td>100 Missoula</td>
</tr>
<tr>
<td>National Bison Range</td>
<td>100 Missoula</td>
</tr>
</tbody>
</table>

a BEA = Bureau of Economic Analysis.

b BLM = Bureau of Land Management.

c NWR = National Wildlife Refuge.
Table 3—Original estimated recreational visits to Federal lands for the basin and BEA\(^a\) areas (1991-93 average), by activity

<table>
<thead>
<tr>
<th>Recreational activity</th>
<th>Boise</th>
<th>Butte</th>
<th>Idaho Falls</th>
<th>Missoula</th>
<th>Pendleton</th>
<th>Bend-Redmond</th>
<th>Spokane</th>
<th>Tri-Cities</th>
<th>Twin Falls</th>
<th>Total basin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of visits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Camping</td>
<td>893,212</td>
<td>158,193</td>
<td>1,046,705</td>
<td>954,681</td>
<td>573,370</td>
<td>882,821</td>
<td>1,149,585</td>
<td>921,339</td>
<td>210,011</td>
<td>6,789,917</td>
</tr>
<tr>
<td>Day use</td>
<td>1,781,576</td>
<td>472,178</td>
<td>2,973,321</td>
<td>3,236,890</td>
<td>1,066,828</td>
<td>2,501,171</td>
<td>3,550,249</td>
<td>1,388,957</td>
<td>491,478</td>
<td>17,462,508</td>
</tr>
<tr>
<td>Fishing</td>
<td>877,076</td>
<td>132,340</td>
<td>350,538</td>
<td>781,316</td>
<td>560,749</td>
<td>968,710</td>
<td>987,831</td>
<td>278,132</td>
<td>236,511</td>
<td>5,673,203</td>
</tr>
<tr>
<td>Hunting</td>
<td>490,748</td>
<td>176,174</td>
<td>474,294</td>
<td>553,630</td>
<td>256,421</td>
<td>226,949</td>
<td>590,229</td>
<td>154,106</td>
<td>127,792</td>
<td>3,050,344</td>
</tr>
<tr>
<td>Motor boating</td>
<td>328,496</td>
<td>51,355</td>
<td>286,956</td>
<td>483,494</td>
<td>44,698</td>
<td>61,711</td>
<td>454,878</td>
<td>102,516</td>
<td>76,146</td>
<td>1,890,251</td>
</tr>
<tr>
<td>Nonmotor boating</td>
<td>134,576</td>
<td>20,083</td>
<td>311,525</td>
<td>93,320</td>
<td>60,280</td>
<td>421,218</td>
<td>170,498</td>
<td>56,951</td>
<td>25,031</td>
<td>1,293,481</td>
</tr>
<tr>
<td>OHV(^b) use</td>
<td>308,370</td>
<td>48,266</td>
<td>413,126</td>
<td>194,364</td>
<td>59,230</td>
<td>74,708</td>
<td>338,800</td>
<td>181,919</td>
<td>103,102</td>
<td>1,721,917</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td>178,426</td>
<td>97,863</td>
<td>432,835</td>
<td>222,892</td>
<td>74,635</td>
<td>99,023</td>
<td>253,945</td>
<td>137,575</td>
<td>44,166</td>
<td>1,541,360</td>
</tr>
<tr>
<td>Trail use</td>
<td>595,418</td>
<td>151,902</td>
<td>1,017,444</td>
<td>738,976</td>
<td>386,781</td>
<td>579,625</td>
<td>875,846</td>
<td>861,180</td>
<td>151,094</td>
<td>5,358,266</td>
</tr>
<tr>
<td>Viewing wildlife</td>
<td>150,746</td>
<td>175,167</td>
<td>160,278</td>
<td>340,024</td>
<td>181,344</td>
<td>633,374</td>
<td>231,623</td>
<td>114,438</td>
<td>43,423</td>
<td>2,030,418</td>
</tr>
<tr>
<td>Winter sports</td>
<td>899,670</td>
<td>103,074</td>
<td>1,423,247</td>
<td>385,346</td>
<td>481,581</td>
<td>858,272</td>
<td>730,714</td>
<td>569,374</td>
<td>274,440</td>
<td>5,725,718</td>
</tr>
<tr>
<td>Total</td>
<td>8,988,724</td>
<td>1,981,132</td>
<td>12,905,225</td>
<td>10,232,732</td>
<td>4,504,248</td>
<td>9,679,134</td>
<td>12,669,453</td>
<td>8,208,365</td>
<td>2,333,564</td>
<td>71,502,577</td>
</tr>
</tbody>
</table>

\(^a\) BEA = Bureau of Economic Analysis.

\(^b\) OHV = off-highway vehicle.

Source: Derived from Haynes and Horne 1997.
Table 4—New estimated recreational visits to Federal lands for the basin and BEA\textsuperscript{a} areas (1991-93 average), by activity

<table>
<thead>
<tr>
<th>Recreational activity</th>
<th>BEA area</th>
<th>Boise</th>
<th>Butte</th>
<th>Idaho Falls</th>
<th>Missoula</th>
<th>Pendleton</th>
<th>Bend- Redmond</th>
<th>Spokane</th>
<th>Tri- Cities</th>
<th>Twin Falls</th>
<th>Total basin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of visits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Camping</td>
<td></td>
<td>985,337</td>
<td>166,316</td>
<td>666,279</td>
<td>855,914</td>
<td>704,173</td>
<td>881,755</td>
<td>1,273,616</td>
<td>889,630</td>
<td>382,221</td>
<td>6,805,241</td>
</tr>
<tr>
<td>Day use</td>
<td></td>
<td>2,046,412</td>
<td>606,364</td>
<td>2,431,983</td>
<td>4,030,341</td>
<td>1,252,786</td>
<td>2,256,114</td>
<td>3,385,908</td>
<td>837,665</td>
<td>651,722</td>
<td>17,499,294</td>
</tr>
<tr>
<td>Fishing</td>
<td></td>
<td>877,392</td>
<td>177,742</td>
<td>780,286</td>
<td>459,433</td>
<td>491,883</td>
<td>1,278,290</td>
<td>1,168,916</td>
<td>116,603</td>
<td>332,401</td>
<td>5,682,946</td>
</tr>
<tr>
<td>Hunting</td>
<td></td>
<td>340,536</td>
<td>264,424</td>
<td>443,529</td>
<td>435,774</td>
<td>312,095</td>
<td>246,718</td>
<td>756,298</td>
<td>95,754</td>
<td>206,197</td>
<td>3,101,325</td>
</tr>
<tr>
<td>Motor boating</td>
<td></td>
<td>577,891</td>
<td>52,177</td>
<td>111,166</td>
<td>122,980</td>
<td>48,953</td>
<td>63,916</td>
<td>818,087</td>
<td>22,049</td>
<td>71,998</td>
<td>1,889,216</td>
</tr>
<tr>
<td>Motor viewing</td>
<td></td>
<td>4,316,792</td>
<td>603,795</td>
<td>1,781,463</td>
<td>1,681,373</td>
<td>814,556</td>
<td>2,445,429</td>
<td>2,962,801</td>
<td>3,184,284</td>
<td>974,086</td>
<td>18,764,579</td>
</tr>
<tr>
<td>Nonmotor boating</td>
<td></td>
<td>148,805</td>
<td>26,222</td>
<td>247,588</td>
<td>78,241</td>
<td>51,035</td>
<td>485,513</td>
<td>222,652</td>
<td>25,315</td>
<td>8,415</td>
<td>1,293,787</td>
</tr>
<tr>
<td>OHV\textsuperscript{b} use</td>
<td></td>
<td>446,927</td>
<td>84,705</td>
<td>237,224</td>
<td>156,644</td>
<td>60,554</td>
<td>80,854</td>
<td>355,961</td>
<td>166,030</td>
<td>187,228</td>
<td>1,689,897</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td></td>
<td>295,141</td>
<td>179,270</td>
<td>325,292</td>
<td>119,186</td>
<td>90,796</td>
<td>102,172</td>
<td>255,060</td>
<td>121,803</td>
<td>53,473</td>
<td>1,776,127</td>
</tr>
<tr>
<td>Trail use</td>
<td></td>
<td>621,122</td>
<td>212,057</td>
<td>773,180</td>
<td>668,781</td>
<td>478,334</td>
<td>613,131</td>
<td>888,158</td>
<td>1,176,156</td>
<td>358,607</td>
<td>5,790,183</td>
</tr>
<tr>
<td>Viewing wildlife</td>
<td></td>
<td>127,977</td>
<td>50,318</td>
<td>96,825</td>
<td>165,514</td>
<td>154,116</td>
<td>829,720</td>
<td>206,238</td>
<td>51,614</td>
<td>120,944</td>
<td>1,803,267</td>
</tr>
<tr>
<td>Winter sports</td>
<td></td>
<td>1,228,730</td>
<td>151,348</td>
<td>805,263</td>
<td>405,536</td>
<td>627,450</td>
<td>902,533</td>
<td>318,280</td>
<td>518,945</td>
<td>773,183</td>
<td>5,731,268</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>12,013,062</td>
<td>2,575,176</td>
<td>8,700,078</td>
<td>9,179,717</td>
<td>5,086,731</td>
<td>10,186,146</td>
<td>12,612,632</td>
<td>7,205,848</td>
<td>4,120,475</td>
<td>71,679,865</td>
</tr>
</tbody>
</table>

\textsuperscript{a} BEA = Bureau of Economic Analysis.
\textsuperscript{b} OHV = off-highway vehicle.
Table 5—Estimated average length of stay, original analysis, by activity

<table>
<thead>
<tr>
<th>Recreational activity</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camping</td>
<td>3.71</td>
</tr>
<tr>
<td>Day use</td>
<td>2.96</td>
</tr>
<tr>
<td>Hunting</td>
<td>5.13</td>
</tr>
<tr>
<td>Fishing</td>
<td>3.14</td>
</tr>
<tr>
<td>Motorized boating</td>
<td>4.41</td>
</tr>
<tr>
<td>Motorized viewing</td>
<td>2.18</td>
</tr>
<tr>
<td>Nonmotorized boating</td>
<td>2.64</td>
</tr>
<tr>
<td>OHV(^a) use</td>
<td>2.72</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td>1.79</td>
</tr>
<tr>
<td>Trail use</td>
<td>2.99</td>
</tr>
<tr>
<td>Viewing wildlife</td>
<td>2.96</td>
</tr>
<tr>
<td>Winter sports</td>
<td>1.66</td>
</tr>
</tbody>
</table>

\(^a\) OHV = off-highway vehicle.

Source: USDA Forest Service, Outdoor Recreation and Wilderness Assessment Group, Southeast Research Station, 320 Green St., Athens, GA 30602-2044.

Table 6—Estimated average spending per person per trip within 50 miles of visited site, for all visitors to Forest Service CUSTOMER and PARVS sites\(^a\)

<table>
<thead>
<tr>
<th>Expenditure item</th>
<th>Camping, picnicking</th>
<th>Trail use</th>
<th>Mechanized travel</th>
<th>Winter activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1993 dollars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lodging, private</td>
<td>5.88</td>
<td>6.67</td>
<td>8.76</td>
<td>17.25</td>
</tr>
<tr>
<td>Lodging, public</td>
<td>6.26</td>
<td>2.53</td>
<td>3.10</td>
<td>.01</td>
</tr>
<tr>
<td>Food</td>
<td>9.57</td>
<td>7.59</td>
<td>8.13</td>
<td>4.84</td>
</tr>
<tr>
<td>Beverages</td>
<td>2.32</td>
<td>1.77</td>
<td>1.80</td>
<td>1.01</td>
</tr>
<tr>
<td>Restaurants</td>
<td>3.35</td>
<td>5.95</td>
<td>8.00</td>
<td>15.20</td>
</tr>
<tr>
<td>Gasoline and oil</td>
<td>6.63</td>
<td>6.32</td>
<td>7.89</td>
<td>2.62</td>
</tr>
<tr>
<td>Air fares</td>
<td>1.07</td>
<td>3.02</td>
<td>2.96</td>
<td>.94</td>
</tr>
<tr>
<td>Car rental</td>
<td>.07</td>
<td>.18</td>
<td>.17</td>
<td>.01</td>
</tr>
<tr>
<td>Other trans.</td>
<td>1.47</td>
<td>2.48</td>
<td>2.82</td>
<td>1.19</td>
</tr>
<tr>
<td>Rec. equipment</td>
<td>1.64</td>
<td>1.64</td>
<td>2.69</td>
<td>1.33</td>
</tr>
<tr>
<td>Rec. services</td>
<td>1.63</td>
<td>1.46</td>
<td>1.55</td>
<td>6.01</td>
</tr>
<tr>
<td>All other</td>
<td>3.13</td>
<td>5.03</td>
<td>4.55</td>
<td>2.44</td>
</tr>
<tr>
<td>Total</td>
<td>43.02</td>
<td>44.63</td>
<td>52.42</td>
<td>52.85</td>
</tr>
</tbody>
</table>

\(^a\) CUSTOMER = customer use and survey techniques for operations, management evaluation, and research; PARVS = public area recreation visitors survey.

Source: USDA Forest Service, Outdoor Recreation and Wilderness Assessment Group, Southeast Research Station, 320 Green St., Athens, GA 30602-2044.
viewing, OHV use, snowmobiling, and motorized boating), and winter activities (includes winter sports except snowmobiling). The previous response multipliers were based on average expenditures per person per day by residents, where “resident” was defined as a resident of the project area. The new response multipliers are based on average expenditures per person per trip within 50 miles of the visited site for all visitors in the sample. Once again, the assumption was made that the percentages of resident and nonresident recreational visitors to all CUSTOMER and PARVS sites would be representative of these percentages for recreational visitors to Federal sites within the project area. These expenditure profiles (measured in constant 1993 dollars) are shown in table 6.

The new expenditure estimates for hunting, fishing, and wildlife viewing were derived from a 1991 national survey of fishing, hunting, and wildlife-associated recreation conducted by the U.S. Fish and Wildlife Service (USDI 1993). Estimates were given for four types of hunting (big game, small game, migratory bird, and other game), freshwater fishing, and nonconsumptive wildlife recreation (observing, feeding, or

<table>
<thead>
<tr>
<th>Expenditure item</th>
<th>Nonresident</th>
<th>Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>11.74</td>
<td>5.14</td>
</tr>
<tr>
<td>Lodging</td>
<td>7.29</td>
<td>.53</td>
</tr>
<tr>
<td>Package fee</td>
<td>.06</td>
<td>.04</td>
</tr>
<tr>
<td>Public transportation</td>
<td>12.03</td>
<td>.02</td>
</tr>
<tr>
<td>Private transportation</td>
<td>6.42</td>
<td>5.37</td>
</tr>
<tr>
<td>Rentals</td>
<td>.00</td>
<td>.24</td>
</tr>
</tbody>
</table>

Total: 37.54 11.34


The estimated number of days for each activity and spender type (e.g., resident big game hunter) also were reported for each state. To estimate the response multipliers, these estimates were used to allocate the percentage of a thousand days that would fall into each category of activity and

<table>
<thead>
<tr>
<th>Expenditure item</th>
<th>Nonresident</th>
<th>Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>15.70</td>
<td>5.14</td>
</tr>
<tr>
<td>Lodging</td>
<td>6.21</td>
<td>.65</td>
</tr>
<tr>
<td>Package fee</td>
<td>.04</td>
<td>.23</td>
</tr>
<tr>
<td>Public transportation</td>
<td>7.32</td>
<td>.03</td>
</tr>
<tr>
<td>Private transportation</td>
<td>6.28</td>
<td>6.00</td>
</tr>
<tr>
<td>Bait</td>
<td>.81</td>
<td>.64</td>
</tr>
<tr>
<td>Boat fuel</td>
<td>.54</td>
<td>1.14</td>
</tr>
<tr>
<td>Boat launch fees</td>
<td>.01</td>
<td>.05</td>
</tr>
<tr>
<td>Boat mooring fees</td>
<td>.86</td>
<td>.77</td>
</tr>
<tr>
<td>Guide fees</td>
<td>.16</td>
<td>—</td>
</tr>
<tr>
<td>Ice</td>
<td>.37</td>
<td>.38</td>
</tr>
<tr>
<td>Rentals</td>
<td>.31</td>
<td>.05</td>
</tr>
</tbody>
</table>

Total: 38.74 17.85

Table 9—Estimated average spending per person per day for nonresident and resident hunters in Idaho, 1991

<table>
<thead>
<tr>
<th>Expenditure item</th>
<th>Big game hunting</th>
<th>Migratory bird hunting</th>
<th>Small game hunting</th>
<th>Other game hunting</th>
<th>Big game hunting</th>
<th>Migratory bird hunting</th>
<th>Small game hunting</th>
<th>Other game hunting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>20.11</td>
<td>21.00</td>
<td>14.85</td>
<td>1.67</td>
<td>10.97</td>
<td>7.99</td>
<td>4.94</td>
<td>5.13</td>
</tr>
<tr>
<td>Lodging</td>
<td>2.50</td>
<td>2.56</td>
<td>.13</td>
<td>.01</td>
<td>.13</td>
<td>.01</td>
<td>.15</td>
<td>.05</td>
</tr>
<tr>
<td>Package fee</td>
<td>2.23</td>
<td></td>
<td>.01</td>
<td>.15</td>
<td>.15</td>
<td></td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>Rentals</td>
<td>.65</td>
<td></td>
<td>.01</td>
<td></td>
<td>.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Transportation</td>
<td>24.28</td>
<td>34.26</td>
<td>15.04</td>
<td>3.33</td>
<td>8.54</td>
<td>9.03</td>
<td>5.51</td>
<td>6.32</td>
</tr>
<tr>
<td>Total</td>
<td>49.12</td>
<td>55.27</td>
<td>32.45</td>
<td>5.00</td>
<td>20.30</td>
<td>17.02</td>
<td>10.65</td>
<td>11.45</td>
</tr>
</tbody>
</table>


Table 10—Estimated average spending per person per trip by activity

<table>
<thead>
<tr>
<th>Recreational activity</th>
<th>Original estimate</th>
<th>New estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1993 dollars</td>
<td></td>
</tr>
<tr>
<td>Camping</td>
<td>95.79</td>
<td>43.02</td>
</tr>
<tr>
<td>Day use</td>
<td>99.22</td>
<td>43.02</td>
</tr>
<tr>
<td>Fishing</td>
<td>120.20</td>
<td>29.86&lt;sup&gt;a&lt;/sup&gt;, 60.54&lt;sup&gt;b&lt;/sup&gt;, 26.11&lt;sup&gt;c&lt;/sup&gt;, 21.68&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Hunting</td>
<td>667.67</td>
<td>23.56&lt;sup&gt;a&lt;/sup&gt;, 58.16&lt;sup&gt;b&lt;/sup&gt;, 29.51&lt;sup&gt;c&lt;/sup&gt;, 19.82&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Motorized boating</td>
<td>125.11</td>
<td>52.42</td>
</tr>
<tr>
<td>Motorized viewing</td>
<td>119.38</td>
<td>52.42</td>
</tr>
<tr>
<td>Nonmotorized boating</td>
<td>1007.55</td>
<td>44.63</td>
</tr>
<tr>
<td>Off-highway vehicle use</td>
<td>27.88</td>
<td>52.42</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td>192.60</td>
<td>52.42</td>
</tr>
<tr>
<td>Trail use</td>
<td>91.40</td>
<td>44.63</td>
</tr>
<tr>
<td>Viewing wildlife</td>
<td>41.82&lt;sup&gt;a&lt;/sup&gt;, 45.38&lt;sup&gt;b&lt;/sup&gt;, 100.74&lt;sup&gt;b&lt;/sup&gt;, 35.57&lt;sup&gt;c&lt;/sup&gt;, 30.31&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Winter sports</td>
<td>77.80</td>
<td>52.85</td>
</tr>
</tbody>
</table>

<sup>a</sup> Estimate for Idaho.
<sup>b</sup> Estimate for Montana.
<sup>c</sup> Estimate for Oregon.
<sup>d</sup> Estimate for Washington.

Sources: Original estimates (based on data only from sites in the basin) from USDA, Outdoor Wilderness and Assessment Group, Southeast Research Station, 320 Green St., Athens, GA 30602-2044. Source for new estimates same as original (based on data from sites nationwide) except for hunting, fishing, and wildlife viewing, which were derived from USDI 1993.
spender type for each state. In Idaho, for example, 48.6 percent of the hunting days were estimated to be by resident big game hunters, 6.1 percent by nonresident big game hunters, 10 percent by resident migratory bird hunters, 0.5 percent by nonresident migratory bird hunters, 23 percent by resident small game hunters, 3.5 percent by nonresident small game hunters, 8.2 percent by resident other game hunters, and 0.1 percent by nonresident other game hunters. Some BEA areas included counties from two states. For these BEA areas, the estimated expenditure and activity percentages used were from the state containing the most counties in that BEA area.

Because the response multipliers for these activities were in jobs per thousand days, but the recreational use data was reported in visits, we had to convert the response multipliers to jobs per thousand visits. The 1991 U.S. Fish and Wildlife survey (USDI 1993) reports the estimated average days per trip as well as the estimated number of trips by each activity and spender type. The percentage of trips by each activity and spender type was multiplied by the average days per trip for that activity and spender type. These numbers were summed to derive the overall estimated days per visit for each broad activity category (hunting, fishing, and wildlife viewing). The response multipliers per thousand days were then multiplied by the estimated days per visit to obtain response multipliers per thousand visits.

The assumptions made here were that the statewide estimates of average expenditures, percentage of day, percentage of trips, and average days per trip—by activity and spender type—are representative of these activities on Federal lands in the project area within each state.

Recreation-Response Multipliers

Economic multipliers typically describe the rate of change in one parameter, such as employment or income, with respect to another, such as the demand for a good or service. Input-output (I-O) models include multipliers of this type. The I-O models are systems of multipliers describing the production response (e.g., the response of producers in terms of required labor inputs, earnings, etc.) in an economy to the demand for various goods and services. The I-O models are usually sufficiently detailed in their specifications that it is possible to determine the multiplier for any of several hundred different types of goods and services.

The activity of recreation unfortunately is not and cannot be classified as a particular good or service. Recreation is an activity engaged in by individuals and can be viewed as an activity in which a variety of goods and services are consumed concurrently. Thus, what is required is not a multiplier relating the production response to the demand for a single good or service, but rather an aggregate multiplier relating the production response to the demand for a collection of goods and services. Such aggregate multipliers are referred to as “recreation-response multipliers” and can be derived for units of various recreational activities, which may have different patterns of demand for goods and services.

Multipliers, either for a particular good or aggregate multipliers for recreational activities, also are typically described as being composed of three parts: the direct effect (the rate at which the primary producers of the demanded good or service are affected), the indirect effect (the rate at which the suppliers of primary producers are

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affected), and the induced effect (the largest indirect effect and the rate at which worker earnings affect producers). Addition of the three parts of a multiplier yields the total multiplier. For example, if a recreationist purchases a meal at a restaurant, the direct employment effect would be the restaurant labor needed to provide that meal. Indirect employment effects would include the labor needed to produce the other inputs (e.g., fish, electricity, napkins) that the restaurant must purchase to provide the meal. Induced employment effects would include the labor needed to produce the goods and services purchased with the wages paid to the employees of the restaurant, as well as other input suppliers that produced the other items necessary to provide the meal.

Only the direct-effect portions of the aggregate multipliers are reported and used in this analysis. Thus for the restaurant meal example, only the restaurant labor needed to provide the meal is included as direct-effect employment.

Many people were concerned that total effect multipliers were used in the previous analysis: They were not. Some of the confusion may have arisen from the fact that all I-O models use producer prices (those paid at the factory door) but expenditures are measured in purchaser prices (those paid at the retail level). In working with the producer-priced I-O model, the purchaser prices must be assigned back to the producing economic sector. Some sectors keep only a part of each dollar spent and pass the rest directly through to the primary commodity sectors. This process is called margining. The following explanation of margining is excerpted from Minnesota IMPLAN Group, Inc. (MIG; 1997: 93-96):

Margins represent the difference between producer and purchaser prices. Margining assigns direct expenditures to the correct I-O sectors. It splits a purchaser price into the appropriate producer values, each value impacting a specific industry. Margins allow us to be more specific as to the economic activity triggered by a retail purchase. Only retail stores that buy goods from manufacturers use margins. Any purchases made by consumers from service-oriented stores do not have margins. Service businesses produce the service at the same time it is purchased so there is no mark-up. Eating and drinking establishments also have no margins, producing their consumables at the time of purchase.

An example, from Johnson and others (1995: 20):

... if a recreationist buys a dollar’s worth of milk, the grocer may keep a margin of $0.25 to cover business expenses and use the remaining $0.75 to buy milk from the wholesale dealer. The wholesaler may keep $0.25 to cover business expenses but use the remaining $0.50 to buy milk from the local dairy. Therefore, the dollar spent is margined off to three sectors.

The I-O models were estimated for the nine BEA functional regional economies listed in table 1. These I-O models were derived by using the IMPLAN modeling system (e.g., Alward and others 1993, MIG 1997). These models are based on highly detailed economic accounts for the counties within each area. Specifically, the I-O models were constructed from economic data for calendar year 1991.

The direct-effect recreation-response multipliers for employment (full- and part-time jobs) were estimated for each functional regional economy within the basin, for each of 12 recreational activities. The original and new direct-effect recreation-response multipliers for employment for each activity in each BEA area are presented in tables 11 and 12, respectively.

10 In strict I-O terminology, the direct effect is not considered a multiplier but a response coefficient. For consistency with earlier documentation (see footnote 7), we use the term “multiplier” here.

11 These response multipliers were provided by Greg Alward and Susan Winter, USDA Forest Service Inventory and Monitoring Institute, 240 W. Prospect Rd., Fort Collins, CO 80526-2098.

12 For ease of comparison, the original direct-effect recreation-response multipliers were converted from jobs per thousand days to jobs per thousand visits.
Table 11—Original estimates of recreation-response multipliers for direct-effect jobs for the BEA\(^a\) areas, 1993, by activity

<table>
<thead>
<tr>
<th>Recreational activity</th>
<th>Boise</th>
<th>Butte</th>
<th>Idaho Falls</th>
<th>Missoula</th>
<th>Pendleton</th>
<th>Bend-Redmond</th>
<th>Spokane</th>
<th>Tri-Cities</th>
<th>Twin Falls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camping</td>
<td>1.86</td>
<td>1.82</td>
<td>2.04</td>
<td>1.95</td>
<td>1.76</td>
<td>1.77</td>
<td>1.64</td>
<td>1.64</td>
<td>2.02</td>
</tr>
<tr>
<td>Day use</td>
<td>1.99</td>
<td>1.91</td>
<td>2.20</td>
<td>2.07</td>
<td>1.89</td>
<td>1.88</td>
<td>1.72</td>
<td>1.73</td>
<td>2.19</td>
</tr>
<tr>
<td>Fishing</td>
<td>2.82</td>
<td>2.51</td>
<td>2.90</td>
<td>2.66</td>
<td>2.65</td>
<td>2.51</td>
<td>2.35</td>
<td>2.53</td>
<td>2.97</td>
</tr>
<tr>
<td>Motorized boating</td>
<td>2.52</td>
<td>2.41</td>
<td>2.72</td>
<td>2.54</td>
<td>2.39</td>
<td>2.35</td>
<td>2.13</td>
<td>2.19</td>
<td>2.69</td>
</tr>
<tr>
<td>Motorized viewing</td>
<td>2.19</td>
<td>2.06</td>
<td>2.33</td>
<td>2.19</td>
<td>2.07</td>
<td>1.98</td>
<td>1.88</td>
<td>1.88</td>
<td>2.36</td>
</tr>
<tr>
<td>Nonmotor boating</td>
<td>22.39</td>
<td>23.00</td>
<td>24.14</td>
<td>24.00</td>
<td>21.30</td>
<td>22.06</td>
<td>20.41</td>
<td>20.35</td>
<td>23.59</td>
</tr>
<tr>
<td>OHV(^b) use</td>
<td>.46</td>
<td>.44</td>
<td>.51</td>
<td>.46</td>
<td>.47</td>
<td>.43</td>
<td>.39</td>
<td>.40</td>
<td>.51</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td>4.44</td>
<td>4.59</td>
<td>4.74</td>
<td>4.60</td>
<td>4.31</td>
<td>4.17</td>
<td>3.91</td>
<td>4.01</td>
<td>4.57</td>
</tr>
<tr>
<td>Trail use</td>
<td>2.26</td>
<td>2.26</td>
<td>2.44</td>
<td>2.37</td>
<td>2.08</td>
<td>2.18</td>
<td>2.00</td>
<td>2.02</td>
<td>2.38</td>
</tr>
<tr>
<td>Viewing wildlife</td>
<td>.87</td>
<td>.90</td>
<td>.94</td>
<td>.92</td>
<td>.86</td>
<td>.86</td>
<td>.77</td>
<td>.78</td>
<td>.91</td>
</tr>
<tr>
<td>Winter sports</td>
<td>2.48</td>
<td>2.39</td>
<td>2.71</td>
<td>2.60</td>
<td>2.31</td>
<td>2.31</td>
<td>2.20</td>
<td>2.19</td>
<td>2.67</td>
</tr>
</tbody>
</table>

\(^a\) BEA = Bureau of Economic Analysis.
\(^b\) OHV = off-highway vehicles.

Source: Derived from Haynes and Horne 1997.
Table 12—New estimates of recreation-response multipliers for direct-effect jobs for the BEA\textsuperscript{a} areas, 1993, by activity

<table>
<thead>
<tr>
<th>Recreational activity</th>
<th>Boise</th>
<th>Butte</th>
<th>Idaho Falls</th>
<th>Missoula</th>
<th>Pendleton</th>
<th>Bend-Redmond</th>
<th>Spokane</th>
<th>Tri-Cities</th>
<th>Twin Falls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jobs per thousand visits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Camping</td>
<td>1.00</td>
<td>0.89</td>
<td>0.97</td>
<td>0.96</td>
<td>0.88</td>
<td>0.85</td>
<td>0.86</td>
<td>0.83</td>
<td>0.95</td>
</tr>
<tr>
<td>Day use</td>
<td>.52</td>
<td>.98</td>
<td>.54</td>
<td>1.02</td>
<td>.73</td>
<td>.71</td>
<td>.48</td>
<td>.51</td>
<td>.53</td>
</tr>
<tr>
<td>Fishing</td>
<td>.60</td>
<td>1.44</td>
<td>.62</td>
<td>1.49</td>
<td>.54</td>
<td>.53</td>
<td>.55</td>
<td>.35</td>
<td>.60</td>
</tr>
<tr>
<td>Hunting</td>
<td>.45</td>
<td>1.39</td>
<td>.48</td>
<td>1.43</td>
<td>.55</td>
<td>.41</td>
<td>.41</td>
<td>.36</td>
<td>.46</td>
</tr>
<tr>
<td>Motor boating</td>
<td>1.39</td>
<td>1.25</td>
<td>1.35</td>
<td>1.34</td>
<td>1.24</td>
<td>1.19</td>
<td>1.20</td>
<td>1.15</td>
<td>1.34</td>
</tr>
<tr>
<td>Motor viewing</td>
<td>1.39</td>
<td>1.25</td>
<td>1.35</td>
<td>1.34</td>
<td>1.24</td>
<td>1.19</td>
<td>1.20</td>
<td>1.15</td>
<td>1.34</td>
</tr>
<tr>
<td>Nonmotor boating</td>
<td>1.11</td>
<td>1.00</td>
<td>1.08</td>
<td>1.08</td>
<td>.98</td>
<td>.95</td>
<td>.96</td>
<td>.92</td>
<td>1.07</td>
</tr>
<tr>
<td>OHV\textsuperscript{b} use</td>
<td>1.39</td>
<td>1.25</td>
<td>1.35</td>
<td>1.34</td>
<td>1.24</td>
<td>1.19</td>
<td>1.20</td>
<td>1.15</td>
<td>1.34</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td>1.39</td>
<td>1.25</td>
<td>1.35</td>
<td>1.34</td>
<td>1.24</td>
<td>1.19</td>
<td>1.20</td>
<td>1.15</td>
<td>1.34</td>
</tr>
<tr>
<td>Trail use</td>
<td>1.11</td>
<td>1.00</td>
<td>1.08</td>
<td>1.08</td>
<td>.98</td>
<td>.95</td>
<td>.96</td>
<td>.92</td>
<td>1.07</td>
</tr>
<tr>
<td>Viewing wildlife</td>
<td>.91</td>
<td>1.91</td>
<td>.92</td>
<td>1.98</td>
<td>.83</td>
<td>.78</td>
<td>.82</td>
<td>.59</td>
<td>.92</td>
</tr>
<tr>
<td>Winter sports</td>
<td>1.89</td>
<td>1.74</td>
<td>1.83</td>
<td>1.85</td>
<td>1.76</td>
<td>1.68</td>
<td>1.66</td>
<td>1.59</td>
<td>1.83</td>
</tr>
</tbody>
</table>

\textsuperscript{a} BEA = Bureau of Economic Analysis.
\textsuperscript{b} OHV = off-highway vehicles.
Direct Employment Estimates

Original Methodology for Direct-Effect Jobs

To estimate the number of direct-effect jobs associated with recreational activity, the estimated days for each recreational activity in each BEA area were multiplied by the direct-effect response multipliers for each BEA area for each activity (measured in jobs per thousand days in the original analysis).

New Methodology for Direct-Effect Jobs

The new methodology is essentially the same except that the new response multipliers are based on the new expenditure estimates and are measured in jobs per thousand visits.

Original Methodology for Percentage of Economy Associated With Recreation

To calculate the percentage of the economy represented by direct-effect jobs associated with recreational activity on Federal lands, the estimated number of direct-effect recreational jobs was divided by the total number of jobs projected by the BEA in 1995 for each BEA area and multiplied by 100. For example, in the Bend-Redmond area where the BEA projected 122,200 jobs in 1995, the estimated percentage of jobs directly associated with camping was 1.28 percent:

\[ \frac{1,569}{122,200} \times 100 = 1.28 \%
\]

New Methodology for Percentage of Economy Associated With Recreation

The new methodology used to calculate the estimated percentage of the economy represented by direct-effect jobs associated with recreational activity on Federal lands is similar to the original
methodology, except that actual 1994 total employment figures were used instead of 1995 projected employment figures.¹³

Flow charts summarizing the original and new methodologies used to calculate direct-effect recreational jobs are provided in figures 3 and 4, respectively.

**Purpose of the Study**

Many readers of the original analysis had a misconception regarding its design and intent. This misconception was that it was an economic base analysis wherein only recreational expenditures representing an inflow of new dollars to the economies of the basin were considered. The actual intent of the analysis was to look at the contribution of expenditures by recreational visitors to Federal lands to economic activity in the area, regardless of whether the expenditures represented an inflow of new money to the area or a recirculation of money already there. This type of analysis has been referred to as both a “contribution analysis”¹⁴ and a “significance analysis.”¹⁵

This contribution analysis was not an attempt to measure the value of recreational activities to the individuals engaging in those activities on Federal lands.

**Limitations of the Visitation and Expenditure Data**

Given the present state of data collection on recreational use, we cannot specify levels of confidence

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¹³ These latter figures were used in the earlier analysis because they were available as part of the BEA data sets, and the 1994 figures were not available at that time.


for the accuracy of these data. The reliability of
the data may differ by land management agency,
by management units within a single agency,
and by recreational activity occurring at a single
management unit. Visitation data, for example,
may be more accurate for controlled and moni-
tored access areas such as national parks, national
historic sites, and developed campgrounds. Esti-
mates for activities such as motorized viewing
and other forms of dispersed recreation occurring
in areas with multiple entry and exit points may
rely more on human judgment and thus be less
reliable. For increased confidence, future visita-
tion estimates should be generated under statisti-
cally valid sampling techniques applied
consistently across the basin.

Because the original expenditure estimates were
derived from samples subsequently deemed too
small or location specific to be representative of
recreational expenditures across the basin, the new
analysis used a new set of expenditure profiles
drawn from larger samples with less location-
specific influences. Two new problems accom-
pany these estimates. First, because the new
expenditure profiles were derived from the more
generalized grouping of recreational activities
(i.e., mechanized travel), variations in expenditure
patterns and levels among the activities in each
group are not revealed. Second, as discussed
above, because the surveys used to derive the new
expenditure estimates included samples from out-
side the basin, we must assume that the expendi-
tures by recreationists in those samples are repre-
sentative of expenditures by recreationists in the
basin. In the absence of statistically valid basin-
wide expenditure surveys, we cannot determine
the accuracy of this assumption.

Results and Discussion

The original and new estimates of direct-effect
jobs associated with each recreational activity on
Federal lands in each BEA area and for the entire
basin are shown in tables 13 and 14, respectively.
The original and new estimates of direct-effect
recreational jobs as a percentage of total jobs for
each BEA area and the basin are presented in
tables 15 and 16, respectively. The new estimated
percentage of direct-effect recreational jobs along
with the estimated percentage of jobs in ranching,
lumber and wood products, mining, and natural
resources (the previous three categories, com-
bined) for each BEA area and the basin are shown
in table 17.16

The new estimate of direct-effect jobs associated
with recreational activities on Federal lands is a
little greater than one-third of the previous esti-
mate. The estimated percentage of total jobs that
are direct-effect recreational jobs is still slightly
more, however, than the percentage of estimated
jobs in natural resources for the entire basin.
Previously, estimated direct-effect recreational
jobs exceeded estimated natural resource jobs in
every BEA area. Now, estimated natural resource
jobs exceed estimated direct-effect recreational
jobs in the Pendleton, Bend-Redmond, and
Spokane BEA areas. Readers should note that the
ranching, mining, and wood products job esti-
mates are estimates of all jobs in these sectors,
not just those stemming from activities on or out-
puts from Federal lands; and the estimated direct-
effect recreational jobs are not estimates of all
jobs associated with outdoor recreational activi-
ties, because many of these activities take place
on non-Federal lands. Moreover, usage of U.S.
Army Corps of Engineer recreational sites was not
included, and as noted above, not all the Federal
management units solicited provided estimates of
their recreational visits.

16 These percentages are not directly comparable. The mining and
lumber and wood products estimates are based on actual job counts
in the Standard Industrial Classification (SIC) categories for these
industries. Because there is no SIC category specifically for ranch-
ing (a subset of the agriculture and agriculture services categories),
that estimate is based on an estimated direct-effect multiplier that
relates the number of ranching jobs to the number of animal unit
months necessary to support the estimated cattle and sheep inven-
tories in the basin. As discussed above in “Recreation-Response
Multipliers,” because recreation is an activity in which a variety of
goods are consumed, an aggregate multiplier is used to estimate the
direct-effect recreational jobs. Although most recreational expendi-
tures typically are concentrated in food, lodging, and transportation
purchases, a small portion of direct-effect recreational jobs may
occur in the lumber and wood products, mining, and ranching
industries because of marging.
Table 13—Original estimates of direct-effect recreational jobs for the basin and BEA\textsuperscript{a} areas, 1993, by activity

<table>
<thead>
<tr>
<th>Recreational activity</th>
<th>BEA area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boise</td>
</tr>
<tr>
<td>Camping</td>
<td>1,664</td>
</tr>
<tr>
<td>Day use</td>
<td>3,549</td>
</tr>
<tr>
<td>Fishing</td>
<td>2,473</td>
</tr>
<tr>
<td>Hunting</td>
<td>7,716</td>
</tr>
<tr>
<td>Motorized boating</td>
<td>826</td>
</tr>
<tr>
<td>Motorized viewing</td>
<td>5,139</td>
</tr>
<tr>
<td>Nonmotor boating</td>
<td>3,014</td>
</tr>
<tr>
<td>OHV\textsuperscript{b} use</td>
<td>143</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td>792</td>
</tr>
<tr>
<td>Trail use</td>
<td>1,344</td>
</tr>
<tr>
<td>Viewing wildlife</td>
<td>131</td>
</tr>
<tr>
<td>Winter sports</td>
<td>2,233</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>29,023</strong></td>
</tr>
</tbody>
</table>

\textsuperscript{a} BEA = Bureau of Economic Analysis.

\textsuperscript{b} OHV = off-highway vehicles.

Source: Derived from Haynes and Horne 1997.
Table 14—New estimates of direct-effect recreational jobs for the basin and BEA areas, 1993, by activity

<table>
<thead>
<tr>
<th>Recreational activity</th>
<th>Boise</th>
<th>Butte</th>
<th>Idaho Falls</th>
<th>Missoula</th>
<th>Pendleton</th>
<th>Bend- Redmond</th>
<th>Spokane</th>
<th>Tri- Cities</th>
<th>Twin Falls</th>
<th>Total basin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camping</td>
<td>985</td>
<td>147</td>
<td>645</td>
<td>823</td>
<td>622</td>
<td>749</td>
<td>1,094</td>
<td>734</td>
<td>364</td>
<td>6,163</td>
</tr>
<tr>
<td>Day use</td>
<td>2,046</td>
<td>538</td>
<td>2,354</td>
<td>3,877</td>
<td>1,107</td>
<td>1,916</td>
<td>2,909</td>
<td>691</td>
<td>621</td>
<td>16,059</td>
</tr>
<tr>
<td>Fishing</td>
<td>525</td>
<td>253</td>
<td>483</td>
<td>686</td>
<td>264</td>
<td>672</td>
<td>638</td>
<td>41</td>
<td>200</td>
<td>3,761</td>
</tr>
<tr>
<td>Hunting</td>
<td>155</td>
<td>367</td>
<td>211</td>
<td>622</td>
<td>186</td>
<td>130</td>
<td>311</td>
<td>35</td>
<td>95</td>
<td>2,212</td>
</tr>
<tr>
<td>Motorized boating</td>
<td>800</td>
<td>65</td>
<td>150</td>
<td>165</td>
<td>61</td>
<td>76</td>
<td>980</td>
<td>25</td>
<td>96</td>
<td>2,419</td>
</tr>
<tr>
<td>Motorized viewing</td>
<td>5,979</td>
<td>753</td>
<td>2,399</td>
<td>2,259</td>
<td>1,012</td>
<td>2,902</td>
<td>3,552</td>
<td>3,662</td>
<td>1,303</td>
<td>23,821</td>
</tr>
<tr>
<td>Nonmotor boating</td>
<td>165</td>
<td>26</td>
<td>267</td>
<td>84</td>
<td>50</td>
<td>460</td>
<td>214</td>
<td>23</td>
<td>9</td>
<td>1,298</td>
</tr>
<tr>
<td>OHV use</td>
<td>619</td>
<td>106</td>
<td>319</td>
<td>210</td>
<td>75</td>
<td>96</td>
<td>427</td>
<td>191</td>
<td>251</td>
<td>2,294</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td>409</td>
<td>224</td>
<td>438</td>
<td>160</td>
<td>113</td>
<td>121</td>
<td>306</td>
<td>140</td>
<td>72</td>
<td>1,982</td>
</tr>
<tr>
<td>Trail use</td>
<td>687</td>
<td>212</td>
<td>835</td>
<td>722</td>
<td>469</td>
<td>581</td>
<td>852</td>
<td>1,082</td>
<td>385</td>
<td>5,825</td>
</tr>
<tr>
<td>Viewing wildlife</td>
<td>117</td>
<td>96</td>
<td>89</td>
<td>327</td>
<td>127</td>
<td>651</td>
<td>170</td>
<td>30</td>
<td>111</td>
<td>1,718</td>
</tr>
<tr>
<td>Winter sports</td>
<td>2,324</td>
<td>263</td>
<td>1,476</td>
<td>749</td>
<td>1,104</td>
<td>1,518</td>
<td>529</td>
<td>825</td>
<td>1,415</td>
<td>10,192</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14,811</strong></td>
<td><strong>2,990</strong></td>
<td><strong>9,665</strong></td>
<td><strong>10,684</strong></td>
<td><strong>5,190</strong></td>
<td><strong>9,872</strong></td>
<td><strong>11,981</strong></td>
<td><strong>7,480</strong></td>
<td><strong>4,921</strong></td>
<td><strong>77,665</strong></td>
</tr>
</tbody>
</table>

*a BEA = Bureau of Economic Analysis.
b OHV = off-highway vehicles.
Table 15—Original estimates of direct-effect recreational jobs as a percentage of total jobs in the basin and BEA\(^a\) areas, 1993, by activity

<table>
<thead>
<tr>
<th>Recreational activity</th>
<th>Boise</th>
<th>Butte</th>
<th>Idaho Falls</th>
<th>Missoula</th>
<th>Pendleton</th>
<th>Bend-Redmond</th>
<th>Spokane</th>
<th>Tri-Cities</th>
<th>Twin Falls</th>
<th>Total basin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camping</td>
<td>0.70</td>
<td>0.53</td>
<td>1.47</td>
<td>1.70</td>
<td>1.06</td>
<td>1.28</td>
<td>0.52</td>
<td>0.51</td>
<td>0.56</td>
<td>0.82</td>
</tr>
<tr>
<td>Day use</td>
<td>1.49</td>
<td>1.65</td>
<td>4.51</td>
<td>6.14</td>
<td>2.13</td>
<td>3.84</td>
<td>1.68</td>
<td>0.80</td>
<td>1.41</td>
<td>2.26</td>
</tr>
<tr>
<td>Fishing</td>
<td>1.04</td>
<td>0.61</td>
<td>1.70</td>
<td>1.90</td>
<td>1.56</td>
<td>1.99</td>
<td>0.64</td>
<td>0.24</td>
<td>0.92</td>
<td>1.00</td>
</tr>
<tr>
<td>Hunting</td>
<td>3.25</td>
<td>5.19</td>
<td>5.49</td>
<td>8.54</td>
<td>4.12</td>
<td>2.88</td>
<td>2.26</td>
<td>0.73</td>
<td>2.80</td>
<td>3.18</td>
</tr>
<tr>
<td>Motor boating</td>
<td>.35</td>
<td>.23</td>
<td>.54</td>
<td>1.12</td>
<td>.11</td>
<td>.12</td>
<td>.27</td>
<td>.08</td>
<td>.27</td>
<td>.31</td>
</tr>
<tr>
<td>Motorized viewing</td>
<td>2.16</td>
<td>1.49</td>
<td>5.64</td>
<td>4.50</td>
<td>1.65</td>
<td>3.85</td>
<td>1.73</td>
<td>2.16</td>
<td>1.70</td>
<td>2.62</td>
</tr>
<tr>
<td>Nonmotor boating</td>
<td>1.27</td>
<td>.85</td>
<td>5.19</td>
<td>2.05</td>
<td>1.35</td>
<td>7.61</td>
<td>.96</td>
<td>.39</td>
<td>.77</td>
<td>1.93</td>
</tr>
<tr>
<td>OHV(^b) use</td>
<td>.06</td>
<td>.04</td>
<td>.14</td>
<td>.08</td>
<td>.03</td>
<td>.03</td>
<td>.04</td>
<td>.02</td>
<td>.07</td>
<td>.05</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td>.33</td>
<td>.22</td>
<td>1.42</td>
<td>.94</td>
<td>.34</td>
<td>.34</td>
<td>.27</td>
<td>.18</td>
<td>.26</td>
<td>.45</td>
</tr>
<tr>
<td>Trail use</td>
<td>.57</td>
<td>.63</td>
<td>1.71</td>
<td>1.60</td>
<td>.85</td>
<td>1.03</td>
<td>.48</td>
<td>.58</td>
<td>.47</td>
<td>.79</td>
</tr>
<tr>
<td>Viewing wildlife</td>
<td>.06</td>
<td>.29</td>
<td>.10</td>
<td>.29</td>
<td>.16</td>
<td>.45</td>
<td>.05</td>
<td>.03</td>
<td>.03</td>
<td>.12</td>
</tr>
<tr>
<td>Winter sports</td>
<td>.94</td>
<td>.45</td>
<td>2.66</td>
<td>.92</td>
<td>1.11</td>
<td>1.63</td>
<td>.44</td>
<td>.42</td>
<td>.96</td>
<td>.93</td>
</tr>
</tbody>
</table>

\(^a\) BEA = Bureau of Economic Analysis.
\(^b\) OHV = off-highway vehicles.

Table 16—New estimates of direct-effect recreational jobs as a percentage of total jobs in the basin and BEA areas, 1993

<table>
<thead>
<tr>
<th>Recreational activity</th>
<th>BEA area</th>
<th>Boise</th>
<th>Butte</th>
<th>Idaho Falls</th>
<th>Missoula</th>
<th>Pendleton</th>
<th>Bend-Redmond</th>
<th>Spokane</th>
<th>Tri-Cities</th>
<th>Twin Falls</th>
<th>Total basin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camping</td>
<td></td>
<td>0.34</td>
<td>0.25</td>
<td>0.43</td>
<td>0.62</td>
<td>0.61</td>
<td>0.48</td>
<td>0.26</td>
<td>0.21</td>
<td>0.42</td>
<td>0.36</td>
</tr>
<tr>
<td>Day use</td>
<td></td>
<td>0.71</td>
<td>.90</td>
<td>1.58</td>
<td>2.92</td>
<td>1.09</td>
<td>1.22</td>
<td>.70</td>
<td>.20</td>
<td>.71</td>
<td>.93</td>
</tr>
<tr>
<td>Fishing</td>
<td></td>
<td>0.18</td>
<td>.43</td>
<td>0.32</td>
<td>0.52</td>
<td>0.26</td>
<td>0.43</td>
<td>.15</td>
<td>0.01</td>
<td>0.23</td>
<td>0.22</td>
</tr>
<tr>
<td>Hunting</td>
<td></td>
<td>0.05</td>
<td>.62</td>
<td>0.14</td>
<td>0.47</td>
<td>0.18</td>
<td>0.08</td>
<td>0.08</td>
<td>0.01</td>
<td>0.11</td>
<td>0.12</td>
</tr>
<tr>
<td>Motorized boating</td>
<td></td>
<td>0.28</td>
<td>.11</td>
<td>0.10</td>
<td>0.12</td>
<td>0.06</td>
<td>0.05</td>
<td>0.24</td>
<td>0.01</td>
<td>0.11</td>
<td>0.14</td>
</tr>
<tr>
<td>Motorized viewing</td>
<td></td>
<td>2.07</td>
<td>1.27</td>
<td>1.61</td>
<td>1.70</td>
<td>1.00</td>
<td>1.85</td>
<td>0.86</td>
<td>1.06</td>
<td>1.50</td>
<td>1.37</td>
</tr>
<tr>
<td>Nonmotor boating</td>
<td></td>
<td>0.06</td>
<td>.04</td>
<td>0.18</td>
<td>0.06</td>
<td>0.05</td>
<td>0.29</td>
<td>0.05</td>
<td>0.01</td>
<td>0.01</td>
<td>0.07</td>
</tr>
<tr>
<td>OHV use</td>
<td></td>
<td>0.21</td>
<td>.18</td>
<td>0.21</td>
<td>0.16</td>
<td>0.07</td>
<td>0.06</td>
<td>0.10</td>
<td>0.06</td>
<td>0.29</td>
<td>0.13</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td></td>
<td>0.14</td>
<td>.38</td>
<td>0.29</td>
<td>0.12</td>
<td>0.11</td>
<td>0.08</td>
<td>0.07</td>
<td>0.04</td>
<td>0.08</td>
<td>0.11</td>
</tr>
<tr>
<td>Trail use</td>
<td></td>
<td>0.24</td>
<td>.36</td>
<td>0.56</td>
<td>0.54</td>
<td>0.46</td>
<td>0.37</td>
<td>0.21</td>
<td>0.44</td>
<td>0.44</td>
<td>0.34</td>
</tr>
<tr>
<td>Viewing wildlife</td>
<td></td>
<td>0.04</td>
<td>.16</td>
<td>0.06</td>
<td>0.25</td>
<td>0.13</td>
<td>0.42</td>
<td>0.04</td>
<td>0.01</td>
<td>0.13</td>
<td>0.10</td>
</tr>
<tr>
<td>Winter sports</td>
<td></td>
<td>0.80</td>
<td>.44</td>
<td>0.99</td>
<td>0.56</td>
<td>1.09</td>
<td>0.97</td>
<td>0.13</td>
<td>0.24</td>
<td>1.63</td>
<td>5.66</td>
</tr>
</tbody>
</table>

**Percentage of total jobs**

<table>
<thead>
<tr>
<th>Total</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.12</td>
<td>5.13</td>
<td>6.50</td>
<td>8.04</td>
<td>5.13</td>
<td>6.30</td>
<td>2.89</td>
<td>2.17</td>
<td>5.66</td>
<td>4.48</td>
</tr>
</tbody>
</table>

---

*a* BEA = Bureau of Economic Analysis.

*b* OHV = off-highway vehicles.
The two recreational activities having the largest decreases in estimated direct-effect jobs were hunting (decreased by 45,686 jobs) and nonmotorized boating (decreased by 27,747 jobs). These large decreases were the result of much smaller estimates of average expenditures per visit for these activities. The estimated number of jobs associated with off-highway vehicle use increased as a result of a larger estimate of average expenditures per visit. Using the original estimates, hunting, motorized viewing, and day use accounted for the largest amounts of the estimated direct-effect jobs associated with recreation. Based on the new estimates, motorized viewing, day use, and winter sports account for the largest amounts of estimated direct-effect jobs associated with recreation.

In the original analysis, the top five BEA areas in terms of the percentage of total jobs estimated to be direct-effect recreational jobs in the previous analysis were, in descending order, Idaho Falls, Spokane, Missoula, Bend-Redmond, and Boise. In the new analysis, the order is Boise, Spokane, Missoula, Bend-Redmond, and Idaho Falls. The switch in order for Idaho Falls and Boise is primarily the result of the change in methodology used to allocate visits to BEA areas. Total estimated recreational visits in the Idaho Falls BEA area decreased by 4,205,147, and estimated visits to the Boise BEA area increased by 3,024,338. The top four BEA areas in terms of the percentage of total jobs estimated to be direct-effect recreational jobs in the previous analysis were, in descending order, Missoula, Idaho Falls, Bend-Redmond, and Pendleton. In the new analysis, the top four are Missoula, Idaho Falls, Bend-Redmond, and Twin Falls.

The BEA area with the largest absolute decrease (34,664 jobs) and percentage of decrease (78 percent) in estimated jobs directly associated with recreation was Idaho Falls; the Twin Falls area

Table 17—Estimated percentage of jobs for each BEA river area and the basin, 1994

<table>
<thead>
<tr>
<th>BEA area</th>
<th>Ranching</th>
<th>Lumber and wood products</th>
<th>Mining</th>
<th>Natural resource</th>
<th>Direct-effect recreation&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boise</td>
<td>1.09</td>
<td>1.82</td>
<td>0.22</td>
<td>3.13</td>
<td>5.12</td>
</tr>
<tr>
<td>Butte</td>
<td>0.89</td>
<td>0.99</td>
<td>1.50</td>
<td>3.39</td>
<td>5.13</td>
</tr>
<tr>
<td>Idaho Falls</td>
<td>1.34</td>
<td>0.49</td>
<td>0.70</td>
<td>2.53</td>
<td>6.50</td>
</tr>
<tr>
<td>Missoula</td>
<td>0.56</td>
<td>4.14</td>
<td>0.31</td>
<td>5.01</td>
<td>8.04</td>
</tr>
<tr>
<td>Pendleton</td>
<td>1.82</td>
<td>3.40</td>
<td>0.13</td>
<td>5.35</td>
<td>5.13</td>
</tr>
<tr>
<td>Bend-Redmond</td>
<td>0.96</td>
<td>6.94</td>
<td>0.18</td>
<td>8.08</td>
<td>6.30</td>
</tr>
<tr>
<td>Spokane</td>
<td>0.39</td>
<td>2.69</td>
<td>0.40</td>
<td>3.48</td>
<td>2.89</td>
</tr>
<tr>
<td>Tri-Cities</td>
<td>0.27</td>
<td>0.96</td>
<td>0.12</td>
<td>1.35</td>
<td>2.17</td>
</tr>
<tr>
<td>Twin Falls</td>
<td>2.23</td>
<td>0.30</td>
<td>0.30</td>
<td>2.83</td>
<td>5.66</td>
</tr>
<tr>
<td>Total basin</td>
<td>0.82</td>
<td>2.37</td>
<td>0.33</td>
<td>3.52</td>
<td>4.48</td>
</tr>
</tbody>
</table>

<sup>a</sup> BEA = Bureau of Economic Analysis.

<sup>b</sup> Based on the estimated direct-effect jobs associated with recreation for the Federal land management units that reported their recreational use data.

Source: Estimates for ranching, lumber and wood products, and mining are from Horne and Haynes (1999) and represent estimates of all jobs in these sectors.
had the smallest absolute decrease (2,896 jobs) and percentage of decrease (37 percent) in jobs. These relative decreases are primarily attributable to the fact that Idaho Falls had the largest percentage of decrease (33 percent) in estimated recreation visits and Twin Falls had the largest percentage of increase (77 percent) in estimated recreation visits with the new visit-allocation methodology.

Debate continues over the current and potential roles of recreation in stimulating economic growth in rural and less diverse regions of the basin. Much of this debate is nested within the larger question regarding the primary determinants in location decisions made by people and businesses. The traditional view is that businesses locate near resources and that people are then attracted to these locations by job opportunities (Richardson 1979); i.e., people follow jobs. An alternative view is that people locate in high-amenity areas based on quality-of-life considerations and that businesses follow in the belief that workers will accept lower wages to remain in high amenity areas; i.e., jobs follow people. 17 Niemi and Whitelaw (1997:31) use the phrase “second paycheck” to represent “the value to residents of the various amenities contributing to the quality of life in the area, including access to social, cultural, and environmental amenities, access they would not enjoy if they lived elsewhere.”

Another aspect of this debate centers on the issue of whether jobs associated with recreation provide lower average incomes, offer fewer benefits, and provide less stimulus to economic growth than other types of jobs. Smith (1989) writes in support of this view, and Christensen and Nickerson (1995) offer a contrary view. Although both studies focus on the tourism industry, many of their findings are probably applicable to direct-effect recreational employment.

Because our analysis examined only one—recreational opportunities on Federal land—of the many amenities that may attract people and businesses to an area, and at only a single point in time, it cannot be used to fully address these larger issues. Given the generality and broad-scale nature of our estimates of BEA area direct-effect recreational jobs, these estimates also cannot be used for a detailed analysis of the significance of recreation at the county or local level. A simple linear regression does provide some interesting insights, however, regarding the variation of these estimates across the basin. The dependent variable in this regression, %Recjobs, is the new estimate of direct-effect recreational jobs as a percentage of total jobs in the BEA area. The following variables are included as regressors:

%Federal The percentage of the total acreage of a BEA area that is National Forest System, Bureau of Land Management, National Park Service, or Fish and Wildlife Service land. 18

%Rural The percentage of the 1990 population in a BEA area not classified as urban by the Bureau of the Census. A simplified definition is that urban residents live in places with a population of 2,500 or more. 19


18 Derived from county figures in McGinnis 1996, table 2.

19 Derived from county figures in McGinnis 1996, table 1.
Pcapinc The per capita total personal income in a BEA area in 1992, measured in 1990 dollars.\textsuperscript{20} Total personal income includes transfer payments (including Social Security and government retirement payments, medicare and medicaid, unemployment insurance benefits, income maintenance payments [including inkind payments, such as food stamps], and others), property income (dividends, interest, and rent), farm income, and nonfarm earnings.

The results of this regression are given in table 18. The adjusted R-squared indicates that the model explains 88 percent of the variation in \%Recjobs for the BEA areas in the basin. The most significant explanatory variable is \%Federal (significant at $\alpha=0.003$ level). This variable has a positive coefficient and can be interpreted as, for a 1-percent increase in BEA area in Federal ownership (as defined above), a 0.077-percent increase in the total jobs in a BEA area that are estimated to be direct-effect recreational jobs, all other things constant. This result is not surprising because \%Federal can be viewed as a proxy for the supply of recreational opportunities in the BEA area.

The next most significant variable is \%Rural (significant at $\alpha=0.020$). This variable also has a positive coefficient, which can be interpreted as, for a 1-percent increase in the population in a BEA area classified as rural, a 0.063-percent increase in total jobs in the BEA area that are estimated to be direct-effect recreational jobs, all other things constant. This supports a hypothesis that the more rural the BEA area, the larger the role that recreation may play in the economy of the area.

Finally, the Pcapinc variable is significant at $\alpha=0.024$. The negative coefficient on this variable can be interpreted as, for a $1.00 increase in per capita income in a BEA area, a 0.0009-percent decrease in total jobs in the BEA area that are estimated to be direct-effect recreational jobs, all other things equal. This suggests that the percentage of jobs in recreation are higher in BEA areas where per capita incomes are lower. The degree that lower per capita incomes may be offset by lower costs of living or larger second paychecks cannot be discerned in the present analysis. Additionally, as mentioned above, because this is a static analysis, the dynamic issue of economic growth cannot be addressed.

\textsuperscript{20} Derived from county figures in McGinnis 1996, tables 1 and 9.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimated coefficient</th>
<th>t-statistic</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>12.7630</td>
<td>2.58</td>
<td>.0496</td>
</tr>
<tr>
<td>%Federal</td>
<td>.0772</td>
<td>5.37</td>
<td>.0030</td>
</tr>
<tr>
<td>%Rural</td>
<td>.0635</td>
<td>3.38</td>
<td>.0196</td>
</tr>
<tr>
<td>Pcapinc</td>
<td>-.0009</td>
<td>-3.19</td>
<td>.0242</td>
</tr>
</tbody>
</table>

\textsuperscript{a} BEA = Bureau of Economic Analysis.
Future Research

If a broad-scale assessment of the direct economic activity associated with recreation on Federal lands is undertaken in the future, we offer the following suggestions to improve the reliability of such estimates.

1. Ensure that the recreational visitation data are collected in a consistent and statistically valid manner across management units and agencies. Information on the proportions of resident versus nonresident and local versus nonlocal recreationists is a critical data element.

2. Collect expenditure data by using the same categories and units of measurement in which the recreational data are recorded (e.g., expenditures per primary visit by nonlocal motorized viewing recreationists).

3. Stratify the expenditure survey samples by the estimated visitation proportions. If it is estimated, for example, that 70 percent of the off-highway vehicle users are locals, about 70 percent of the expenditure survey sample for off-highway vehicle use should be locals.

4. Collect visitation and expenditure data with as much geographic specificity as possible, so that expenditures and the resultant associated economic activities are attributed as closely as possible to the areas where they are actually occurring.

Acknowledgments

Literature Cited


Rudzitis, G.; Johansen, H.E. 1989. Amenities, migration, and nonmetropolitan regional development. Moscow, ID: Department of Geography, University of Idaho; report to the National Science Foundation.


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