

National Forest Visitor Spending Averages and the Influence of Trip-Type and Recreation Activity

Eric M. White and Daniel J. Stynes

ABSTRACT

Estimates of national forest recreation visitor spending serve as inputs to regional economic analyses and help to identify the economic linkages between national forest recreation use and local forest communities. When completing recreation-related analyses, managers, planners, and researchers frequently think of visitors in terms of recreation activity. When completing recreation visitor spending analyses we argue that visitors should be segmented based primarily on the type of recreation trip taken. Using survey data collected as part of the US Forest Service National Visitor Use Monitoring program we examine the efficacy of trip-type segmentation relative to one based on recreation activity. We show that spending averages developed for activity groups without regard to trip type provide an incomplete picture of recreation visitor spending. Ultimately, trip type is shown to have a greater role in influencing the level of recreation visitor expenditures than recreation activity. Implications for national forest planning and management are discussed.

Keywords: recreation visitor spending, economic impact, national forests, National Visitor Use Monitoring

Recreation managers, planners, and researchers frequently divide recreation visitors into distinct subgroups based on demographic, socioeconomic, psychographic, and other visitor characteristics. Recreation activity subgroups are perhaps the most widely used, because they relate directly to decisions about facilities and programs that support particular activities (e.g., Brunson and Shelby 1991, Daigle et al. 1994, Bowker et al. 1999, and Rosenberger and Loomis 2001). A land-management focus suggests

dividing recreation visits based on the recreation opportunity spectrum (e.g., Buist and Hoots 1982 and Rosenthal and Walsh 1986). Management focused more on the visitors themselves may favor demographic or benefits-based segments (e.g., Christensen et al. 1987, Johnson and Bowker 1999, and Oku and Fukamachi 2006). Although these segmentations have been useful in guiding many management and development decisions, they are of limited use in addressing the role of national forests in regional economic development and tourism.

Over the past 20 years, rural public lands have been recognized increasingly as important tourist destinations that bring visitors to the region (e.g., Douglas and Harpman 1995, Donnelly et al. 1998, and English et al. 2000). The expenditures of these visitors support local businesses and bring income and jobs to the region. Because some regions have experienced declines in timber harvests, tourism development has been advanced as one means of supporting the economies of local communities. Additionally, forest recreation management and planning now gives more attention to marketing (e.g., national forest niche analysis) and identifying the recreation-related economic linkages (e.g., economic impact and economic contribution analysis) between the forest resource and local communities. Estimates of the spending of national forest recreation visitors provide the basis for estimating the economic contributions of forest recreation to local economies.

Based on their usefulness for other management purposes, on the surface it seems appropriate to develop estimates of recreation visitor spending for visitors engaged in particular recreation activities. Previous spending averages developed for na-

Received April 17, 2007; accepted January 4, 2008.

Eric M. White (emwhite@fs.fed.us) is research economist, US Forest Service, Pacific Northwest Research Station, 3200 Southwest Jefferson Way, Corvallis, OR 97330. Daniel J. Stynes (stynes@msu.edu) is professor emeritus, Michigan State University, 131 Natural Resources Bldg., East Lansing, MI 48824. The authors appreciate the assistance of Ross Arnold, Don English, Mike Niccolucci, Mike Retzlaff, and Susan Winter in providing data and support for this research.

Copyright © 2008 by the Society of American Foresters.

tional forest visitors indeed have been developed within broad activity classes (see Alward et al. 1998). However, in household and visitor tourism surveys, such as the American Travel Survey (Bureau of Transportation Statistics) and those conducted by the Travel Industry Association (Travel Industry Association 2005), travelers are divided more often into subgroups based on broader trip purposes (pleasure, business, and visiting friends and relatives), transportation modes (air and automobile), lodging types (hotel, campground, and private home), or length of stay (day, weekend, and vacation). Segmentation along these lines provides for better explanation of visitor spending patterns and facilitates application of visitor spending averages to regional economic analysis. The tourism approach to segmentation also avoids difficulties in classifying recreation trips that involve multiple activities.

For most trips, the majority of visitor spending is for lodging, meals, transportation, and shopping/souvenirs (see Bowker et al. 2007, Crompton et al. 2001, and US Department of Interior [USDI] Fish and Wildlife Service and USDC Census Bureau 2007). Spending for these services and goods are most influenced by the type of recreation trip and the distance traveled. Other factors influencing the level of visitor expenditures include the size of the recreation party, length of stay in the forest area, and local prices and spending opportunities. The influence of party size and length of stay can be captured by reporting spending averages on a per person and per night basis, respectively (see Frechtling 1978 and Sun and Stynes 2006). The primary recreation activity does influence some kinds of spending, e.g., fuel purchases for motorized activities such as snowmobiling, motorized boating, and off-highway vehicle (OHV) use; bait and tackle for fishing; and use fees for downhill skiing. However, these activity-related costs are typically a small percentage of the overall trip costs.

The purpose of this article is to compare visitor spending patterns for subgroups of visitors defined by primary recreation activity with spending patterns for visitors defined by recreation trip types. Using national forest visitor spending data collected via the National Visitor Use Monitoring (NVUM) program, we present spending profiles for activity and trip-type segments and show that trip types explain much more of the variation in visitor spending than recreation

Table 1. Primary recreation activities for national forest visitor spending.

Activity	Description
Downhill skiing	Downhill skiing or snowboarding
Cross-country skiing	Cross-country skiing or snowshoeing
Snowmobile	Snowmobile travel
Hunting	Hunting—all types
Fishing	Fishing—all types
Nature related	Viewing nature, viewing wildlife, visiting a nature center, or completing nature study
OHV use	Off-highway vehicle travel (four-wheelers, dirt bikes, and so on)
Driving	Driving for pleasure on roads
Developed camping	Camping in developed campground sites
Primitive camping/backpacking	Primitive camping, backpacking, or camping in unroaded areas
Hiking/biking	Hiking or walking, or bicycling (including mountain biking)
Other	Any remaining activity, those visitors engaged in multiple primary activities, or those visitors not reporting a primary activity

activities. We present suggestions for management and planning based on recreation trip types.

Methods

NVUM Program and Survey Instrument. We use national forest visitor survey data collected during the first round of the NVUM program to develop the visitor spending averages and to examine the influence of activity and trip type on visitor spending. The first round of NVUM included 4 years of sampling and lasted from calendar year 2000 through federal fiscal year 2003. The primary objective of the NVUM program is to develop statistically reliable estimates of national forest recreation visitation (English et al. 2002). Secondary objectives of NVUM are to characterize recreation visitors in terms of demographics, recreation-related expenditures, and satisfaction with the recreation experience.

Approximately ¼ of the units in the National Forest System were surveyed in each year of NVUM round 1 with all 119 administrative national forests and grasslands being sampled once during the round. The NVUM program uses a sampling protocol that includes both traffic counts and visitors surveys conducted at specific locations and days within a national forest. The locations and days for NVUM sampling are selected via a stratified random sample where potential interview locations are stratified by site type and potential interview days are stratified by the expected level of exiting recreation traffic. On NVUM sample days, national forest recreation visitors are selected randomly to complete onsite visitor questionnaires. See English et al. (2002)

for a complete description of the NVUM sampling protocol.

During the entirety of round 1, slightly more than 90,000 “basic” NVUM surveys were completed by recreation visitors. Slightly less than ¼ of these respondents were randomly selected to complete an “economic” supplemental NVUM questionnaire. This economic supplement gathered information on the spending of the travel party within 50 mi of the interview site during the current recreation trip to the national forest [1]. Respondents were asked to report expenditures already made and expenditures expected to be made before leaving the 50-mi area. Spending was reported within 10 expenditure categories. Respondents completing the economic supplement also reported the number of days away from home during the trip and if the national forest was the primary recreation destination on the trip. The reported spending of visitors sampled in years before 2003 was converted to 2003 dollars using the Bureau of Labor Statistics price indices for each expenditure category.

Definitions of Activity and Trip-Type Segments. Activity segments were defined based on the primary activity during the national forest recreation visit as identified by the NVUM respondent. Primary recreation activities were selected by NVUM respondents from a list of 26 recreation activities. To assure adequate sample sizes, we aggregated these into 12 activities (Table 1). The aggregated activity groups were identified in consultation with National Forest System regional economists to ensure that the resulting groups reflected those commonly needed for planning and analysis purposes.

Four trip-type segments were defined from variables included in the NVUM survey and considered in this analysis: (1) nonlocal day trips, (2) nonlocal overnight trips, (3) local day trips, and (4) local overnight trips. Local visitors were defined as those living less than 50 mi from the recreation site and nonlocal visitors were those living more than 50 mi from the recreation site [2]. Day trips did not involve an overnight stay away from the visitor's permanent residence. Overnight trips included an overnight stay either on national forestland (e.g., in national forest campgrounds, cabins, resorts) or off the national forest (e.g., hotels/motels, private campgrounds, seasonal homes).

The first dimension of our trip-type segmentation is to distinguish between recreation trips made by local residents and trips made by tourists (nonlocals). In tourism applications, tourists are defined typically as individuals traveling at least 50 mi away from home (Hunt and Layne 1991, Travel Industry of America 2005, Lee et al. 2007). Local visitors and tourists are distinct markets with very different use patterns and socioeconomic characteristics, not to mention different levels of familiarity with the area and likely responses to management and marketing efforts. Local and tourist visitors also have different spending patterns. Local residents are an important market segment and constitute more than 50% of the national forest recreation visits occurring annually (Stynes and White 2005a), but the custom in regional economic analysis generally is to exclude their spending when estimating economic impacts (English and Bowker 1996, Watson et al. 2007).

Distinguishing between day and overnight trips is the second dimension of our trip-type segmentation. Visitors on overnight trips away from home will have spending patterns that differ from visitors on day trips. For example, it is reasonable to expect that most overnight trip visitors will pay for some form of lodging (e.g., hotel/motel rooms, fees in a developed campground) while those on day trips have no lodging expenses. In addition, visitors on overnight trips likely will have to purchase more food during their trip (e.g., spending in restaurants and grocery stores). Combining the local/nonlocal dichotomy with day and overnight trip characterization yields four segments that are likely more useful for economic analyses than those based solely on recreation activities.

Table 2. Average trip spending of national forest visitors by trip-type segments (dollars per party per trip).

Spending category	Nonlocal		Local	
	Day	Overnight	Day	Overnight
Lodging	0	47.08	0	16.82
Restaurant/bar	13.60	43.98	6.12	16.96
Groceries	7.61	34.13	5.41	33.63
Gas and oil	15.99	36.53	11.67	26.95
Other transportation	0.98	5.42	0.21	0.58
Activities	3.87	12.32	1.82	5.06
Admissions/fees	5.24	9.53	3.42	9.62
Souvenirs/other	4.31	19.26	4.19	11.32
Total spending	51.60	208.23	32.84	120.93
<i>n</i>	1,600	5,685	7,241	2,906
Percent error (95% conf.)	8%	3%	5%	5%
Subsets ^a	a	b	c	d

Spending reported in 2003 dollars.

^a The letters a, b, c, and d identify statistically different subsets based on total spending averages ($P < 0.05$).

A fifth trip-type segment, nonprimary trips, was composed of visitors whose primary trip purpose was something other than recreating on the national forest. In this study, this trip-type segment was identified and removed from additional analyses. The spending of individuals whose recreation visit is secondary to some other trip purpose typically is excluded from recreation economic analyses because the trip spending can not be attributed solely to the recreation resource. Trip-type segments similar to those adopted in this study also have been used in other analyses examining recreation visitor spending (e.g., Stynes 2005, Bowker et al. 2007).

Examination of National Forest Visitor Spending Averages and Statistical Tests. After removing economic respondent cases that met one or more of the conditions for removal as identified in Stynes and White (2005a) (e.g., a spending contaminant or outlier and excessive trip length), those with incomplete data necessary for segment development (e.g., respondent's failure to report a ZIP code), and those where the primary trip purpose was something other than visiting the national forest (e.g., business, visiting friends and relatives), 17,432 cases remained for this analysis. Individual cases were weighted with an exposure weight to correct for overrepresentation of those individuals who visited multiple recreation sites or areas during their national forest visit. Additional descriptions of the methods adopted in analyzing the NVUM visitor spending data are available in Stynes et al. (2003) and Stynes and White (2005a).

Differences between average spending were tested using *t*-tests with alpha equal to

0.05. To determine whether the trip-type segmentation yielded statistically unique spending groups, the trip segment spending averages were compared statistically with one another. To identify those activity groups that would otherwise be determined to have above or below average spending ignoring trip type, activity segment spending averages were compared statistically with the overall spending average. This analysis then was completed again incorporating trip type. Spending averages for activities within trip type (e.g., cross-country skiers engaged in nonlocal day trips) were not reported or analyzed if there were less than 50 cases in the group. Finally, analysis of variance (ANOVA) was used to compare the relative importance of the trip type and activity segmentations in predicting spending.

Results

Trip-type Spending Averages. The spending averages of the four trip-type segments are all statistically different from one another (Table 2). The average spending of national forest recreation visitors on a per party trip basis was \$33 for local day trips, \$52 for nonlocal day trips, \$121 for local overnight trips, and \$208 for nonlocal overnight trips. Parties on overnight trips spend about four times as much as parties on day trips. Overnight trip parties spend approximately five times more on groceries and two to three times more on restaurants and for gasoline and oil than their day trip counterparts. Local overnight parties spend approximately three times more and nonlocal overnight parties spend almost five times more than their respective day trip counterparts on souvenirs and other expenses.

Expenses for lodging, food (restaurants/bars and groceries), and gas and oil constitute approximately 71% of the trip expenses of visitors on day trips and 78% of the trip expenses of visitors on overnight trips (Table 2). On day trips, the greatest single expense is for gas and oil purchases (approximately 1/3 of trip expenses). Lodging constitutes the largest single expenditure for visitors on nonlocal overnight trips whereas grocery purchases are the greatest single expenditure for local overnight visitors. Combined, expenditures for use fees, admissions, sporting goods, and souvenirs (activities, admissions/fees, and souvenirs/other) constitute approximately 25% of trip expenditures across all trip types.

Spending Averages for Activity Segments. Spending averages for visitors engaged in the 12 activity segments considered range from \$42 per party trip for those "driving for pleasure" to \$161 per party trip for those downhill skiing (Table 3). Not accounting for trip types, the average spending of visitors in 7 of the 12 activity segments is statistically different from the overall average. Without taking trip type into account, the activity segment spending averages indicate that national forest visitors engaged in downhill and cross-country skiing, developed camping, snowmobiling, and hunting spend more than average while visitors engaged in hiking/biking and driving for pleasure spend less than average.

Spending Averages by Activity and Trip Type. Within trip types, spending averages for visitors engaged in specific activities do not generally differ from the overall spending average for the type of trip taken (Table 4). For example, within the nonlocal day trip segment, only the average expenditures of those engaged in downhill skiing (\$80), snowmobiling (\$108), and hiking/biking (\$37) are statistically different from the overall nonlocal day trip spending average (\$52). Nonlocal day trip visitors engaged in the other activities considered had spending that was not statistically different from the overall average spending for nonlocal day trips. A number of activities within the local day trip segment do have spending that was found to be statistically different from the overall local day trip-type average. However, these statistical differences are primarily a function of the large number of local day trip observations and many are small from a nominal standpoint.

Only for downhill skiing, snowmobiling, and primitive camping/backpacking are

Table 3. Average visitor spending within activity groupings (dollars per party per trip).

Activity	Spending average	n	Percent error (95% conf.)
Downhill skiing	\$161 ^a	795	9%
Cross-country skiing	\$134 ^a	377	15%
Developed camping	\$134 ^a	1,267	7%
Snowmobile	\$119 ^a	352	19%
Hunting	\$107 ^a	948	11%
Primitive camping/backpacking	\$99	659	11%
Nature related	\$92	1,558	10%
Fishing	\$89	1,604	10%
Other	\$88	5,054	6%
OHV use	\$77	512	15%
Hiking/biking	\$61 ^a	3,802	9%
Driving	\$42 ^a	504	31%
Overall average	\$88	17,432	3%

Spending reported in 2003 dollars.

^a Statistically different from the overall average ($P < 0.05$).

Table 4. Spending of national forest recreation visitors by activity and trip type (dollars per party per trip).

Activity	Nonlocal		Local		Spending average
	Day	Overnight	Day	Overnight	
Downhill skiing	80 ^a	342 ^a	53 ^a	152	161 ^a
Cross-country skiing	b	335 ^a	34	b	134 ^a
Developed camping		141 ^a		128	134 ^a
Snowmobile	108 ^a	322 ^a	68 ^a	b	119 ^a
Hunting	44	221	51 ^a	151 ^a	107 ^a
Primitive camping/backpacking		105 ^a		94 ^a	99
Nature related	52	223	27 ^a	129	92
Fishing	42	220	42 ^a	120	89
Other	50	197	36	122	88
OHV use	63	162 ^a	38	108	77
Hiking/biking	37 ^a	246 ^a	20 ^a	87 ^a	61 ^a
Driving	40	173	24 ^a	b	42 ^a
Overall average	52	208	33	121	88

Spending reported in 2003 dollars. The letter b denotes less than 50 observations.

^a Statistically different from the trip type overall average ($P < 0.05$).

the spending averages for specific activities systematically higher or lower than the overall trip-type spending averages (Table 4). More typically, activity-specific spending averages are more similar to the overall spending average within trip type than the average spending of visitors engaged in the same activity but completing a different type of trip. For example, the average spending of anglers on nonlocal day trips (\$42) is more similar to overall average spending of nonlocal day trip visitors (\$52) than to the average spending of anglers on nonlocal overnight trips (\$220).

Analysis of Variance. The relative importance of trip types and activities in predicting spending patterns can be shown statistically via ANOVA. Focusing on the main effects of a general linear model with trip type and activity as the explanatory factors, trip type uniquely explains 27% of the vari-

ation in spending and primary activity explains just 1%. An additional 0.5% of the variation in spending is in common between the two factors.

Discussion

Further Examination of Activity Segment Spending Averages. Fundamentally, the spending averages for visitor activity segments, as shown in Table 3, are a function of (1) the distribution of trip types of the visitors engaged in the activity (i.e., the percentage of angling visits that are local day trips, nonlocal overnight trips, and so on) and (2) the spending patterns of visitors engaged in those recreation trip types (i.e., nonlocal day trip spending, local overnight trip spending, and so on). Activity segments in Table 3 with greater than average spending (e.g., downhill skiing, developed camping, hunting, to name a few) generally have a

higher percentage of trips by nonlocals (e.g., downhill skiing) or a greater percentage of visits that are overnight trips (e.g., developed camping and hunting) than the overall average trip distribution (Table 5). Because visitors in the nonlocal and overnight trip types have greater spending, it is expected that spending averages for these activity groups would be greater than average. Conversely, activity segments in Table 3 with lower than average spending (hiking/biking and driving for pleasure) have greater percentages of visits by locals on day trips—the trip type with the lowest expected spending—than the overall average trip distribution (Table 5). Activities with spending averages in Table 3 that are not statistically different from the overall average (e.g., nature-related, fishing, and so on) generally have distributions of trip types that mirror the overall distribution (Table 5).

Ignoring trip type and reporting average spending for activity segments alone (e.g., Table 3) also can mask important differences in the spending of visitors engaged in the activity but participating in different types of recreation trips. In almost all cases, the activities in Table 3 with statistically different spending averages (i.e., cross-country skiing, hiking/biking, and so on) have just one or two trip types with spending averages that are statistically or practically different from the respective trip-type overall average (Table 4). For example, while cross-country skiing is shown to have above-average spending in Table 3, only those cross-country skiers on nonlocal overnight trips actually have spending that is above the respective trip-type average spending. The average spending of cross-country skiers on local day trips is nearly identical to the respective overall local day trip average. Likewise, the average spending of hunters on local trips (day and overnight) is statistically greater than average but the spending of hunters on nonlocal trips (day and overnight) is not (Table 4). In some cases, the directions of statistical differences in average spending within an activity group may differ by trip type. For example, visitors engaged in hiking/biking have statistically lower than average spending when on nonlocal day trips, local day trips, and local overnight trips but statistically greater than average spending when on nonlocal overnight trips (Table 4). Finally, activity spending averages that ignore trip type may mask statistically different spending that is present within trip types. For example, the spending of anglers as reported in Table 3 is not sta-

Table 5. Distribution of national forest recreation visits by activity and trip type.

Activity	Nonlocal		Local		Total
	Day	Overnight	Day	Overnight	
	.(%)				
Downhill skiing ^a	16	34	44	6	100
Cross-country skiing ^a	9	30	56	4	100
Developed camping ^a	0	45	0	56	100
Snowmobile ^a	7	15	66	12	100
Hunting ^a	4	19	52	24	100
Primitive camping/backpacking	0	46	0	54	100
Nature related	13	27	52	8	100
Fishing	11	22	57	10	100
Other	9	23	52	15	100
OHV use	11	23	53	12	100
Hiking/biking ^a	9	17	68	7	100
Driving ^a	7	10	80	3	100
Overall average	9	24	53	14	100

Source: Adapted from Stynes and White (2006).

Spending reported in 2003 dollars.

^a Activity spending average statistically different from the overall average in Table 3.

Table 6. Average trip spending of snowmobilers by trip-type segments (dollars per party per trip).

Spending category	Nonlocal		Local	
	Day	Overnight	Day	Overnight ^a
Lodging	0	87.80	0	
Restaurant/bar	22.92	97.60	11.28	
Groceries	11.50	25.25	7.02	
Gas and oil	52.48	64.42	31.64	
Other transportation	0.75	1.67	0.26	
Activities	10.72	23.97	2.14	
Admissions/fees	8.32	8.01	6.64	
Souvenirs/other	1.42	13.59	9.48	
Total spending	108.11	322.32	68.45	
<i>n</i>	56	95	162	
Percent error (95%)	38%	19%	19%	

Spending reported in 2003 dollars

^a Less than 50 observations.

tistically different from average, but when also considering trip type we find that the spending of anglers on local day trips is greater than average (Table 4).

The unique activity-related spending differences that do exist are clearer if we examine detailed spending profiles. Typically, the unique spending associated with an activity can be traced to greater (or lesser) spending in one or more expenditure categories that relate to the activity itself. Spending averages for snowmobiling, downhill skiing, and hiking/biking are illustrative. Compared with the spending averages in Table 2, the greater spending by snowmobilers can be traced primarily to additional expenditures on gas and oil and restaurant meals (Table 6). Similarly, the statistically greater spending of downhill skiers is largely a function of greater spending for activity

and admission fees, likely reflecting additional expenditures for lift tickets and equipment rentals (Table 7). Downhill skiers on overnight trips also spend more on lodging, in restaurants, and for local transportation. Bikers and hikers on nonlocal day trips, local day trips, and local overnight trips spend less than the overall average in all categories, but particularly in the gas and oil and groceries categories (Table 8).

Management and Planning Applications of Trip-Type Segmentation. There are a number of ways that a focus on trip types can further inform forest recreation planning and management. In terms of local economic impact, it is imperative that local visitors be distinguished from tourists to the area. Spending by local residents on forest visits does not constitute “new” money to the local economy and, normally, should be

excluded when estimating economic impacts [3]. Many locals will be regular visitors, who are familiar with the forest and the local area, while many tourists may be first time or infrequent visitors requiring more information about places to stay, where to purchase supplies, and the variety of attractions and things to do in the area. In addition, tourists are more likely to be found at the more popular sites in the forest near major travel routes.

Encouraging visitors to stay overnight in the area increases their spending and ultimately their local economic impact (see Bowker et al. 2007 for a comparison of day trip and overnight trip economic impact). Overnight stays could be encouraged by providing information about lodging facilities and local attractions in the area—both on and off the forest. Recreation managers should keep in mind that travelers obtain information at home in preparing for a trip, en route to the recreation destination, and at the destination. It may be useful to provide information on the national forest website, at nearby highway welcome or visitor centers, and other places where tourists may be found.

Forest visitors on overnight trips away from home can be divided into those staying on the forest, those staying off the forest but in the local area, and those passing through the area to another destination. Visitors staying on the forest in campgrounds or cabins likely desire information about places to eat, locations to purchase supplies, and attractions and entertainment opportunities in nearby communities. Visitors staying in motels or campgrounds near the forest or passing through the area may be more likely to visit the forest if they are made aware of scenic drives, hiking trails, and other recreation opportunities on the forest.

In addition to the NVUM data, secondary data can provide some indication of the proportion of visitors that are local versus nonlocal or on day versus overnight trips to the national forest. The number of local visitors to the national forest will be related to the size of the population living within 50 mi of the forest. A good indicator of the potential size of the population of overnight visitors is the number of overnight accommodations in the area (campsites, motel rooms, and seasonal homes). Forests should inventory not only those facilities on forestlands, but also other public and private accommodations where forest visitors are likely to stay. In addition to public and com-

Table 7. Average trip spending of downhill skiers by trip-type segments (dollars per party per trip).

Spending category	Nonlocal		Local	
	Day	Overnight	Day	Overnight ^a
Lodging	0	91.30	0	
Restaurant/bar	13.60	66.76	9.79	
Groceries	5.47	26.06	2.75	
Gas and oil	13.21	31.95	11.19	
Other transportation	0	18.22	0.01	
Activities	18.06	45.98	11.95	
Admissions/fees	24.65	33.98	12.62	
Souvenirs/other	4.55	27.72	5.03	
Total spending	79.54	341.95	53.34	
<i>n</i>	138	193	397	
Percent error (95%)	20%	12%	16%	

Spending reported in 2003 dollars.

^a Not statistically different from the overall trip-type average.

Table 8. Average trip spending of hikers and bikers by trip-type segments (dollars per party per trip).

Spending category	Nonlocal		Local	
	Day	Overnight	Day	Overnight
Lodging	0	73.88	0	15.23
Restaurant/bar	12.42	61.17	4.24	15.97
Groceries	5.15	33.75	3.15	17.91
Gas and oil	10.17	30.87	7.56	18.36
Other transportation	2.67	10.44	0.14	1.67
Activities	0.94	8.44	0.63	6.55
Admissions/fees	2.77	5.05	2.36	4.25
Souvenirs/other	2.54	22.07	2.07	6.73
Total spending	36.66	245.66	20.15	86.67
<i>n</i>	372	885	2,227	318
Percent error (95%)	23%	7%	11%	5%

Spending reported in 2003 dollars.

mercial lodging facilities, some tourists to the area will be staying with friends and relatives who live nearby.

Conclusions

Lodging, food, and gas and oil constitute the greatest expenses during national forest recreation trips. Spending in these categories is determined primarily by the type of recreation trip taken. Party size, length of stay, and local economic conditions also influence the level of spending in these categories. In general, the recreation activity has relatively little impact on the level of expenditures for these services and goods. Some activities do have particular spending patterns that result in unique spending within a given trip type. The spending patterns associated with these activities generally are intuitive (e.g., increased spending for gas and oil in motorized activities, use fees, and equipment rental for downhill skiers, to name a few).

The trip-type segmentation we propose

here is more consistent with the segmentation approaches adopted by travel and tourism organizations and better facilitates estimation of local economic impacts and contribution of national forest recreation than a segmentation based on activity alone. To apply trip-type spending averages for forest economic impact analyses, planners and managers must be able to estimate the number of visits occurring or expected to occur within the trip types. For the National Forest System, the NVUM program data provide the necessary information to estimate trip-type visits for forest, regional, and national-level analyses (Stynes and White 2005a). For other recreation resources, previously conducted research studies or local knowledge may be used to determine the number of visits in the trip-type segments.

In many project-level and some forest-level analyses, managers are concerned with the impacts of a management action on users in individual activities (e.g., a closure of an

OHV use area). In these cases, managers and planners may need to use activity-specific spending averages. However, we recommend that activity-specific spending averages still be estimated within the trip-type framework. Failure to account for trip types in such analyses ignores the differences in spending between local and nonlocal and day and overnight trips. Managers should keep in mind that, despite perceptions, the spending of particular activity segments are likely not statistically or substantively different from that of the general visitor population when trip types are taken into account.

Spending averages for trip types are more generalizable across forests than spending averages based on activity alone. Activity spending averages are, to a large extent, a function of the distribution of day and overnight and local and nonlocal trips occurring on the forest for that activity. It is then problematic to apply these spending averages to other national forests that may attract different distributions of local and nonlocal and day and overnight trips. Spending averages based on trip types avoid this difficulty because the between forest variability in the types of trips attracted to the forest are accounted for when visits by trip type are applied to the spending averages to estimate total spending.

For simplicity and owing to data limitations in the first round of NVUM we have reported spending for highly aggregated overnight segments. There still is considerable additional variation in spending within these segments that could be accounted for if the overnight trip segments were further divided based on the type of lodging used during the trip (see Stynes and White 2005b). Specifically, further explanation of the variance in spending among overnight trips could be achieved by differentiating between those overnight trip visitors staying in campgrounds, hotels/motels, or in the private homes of friends or relatives.

One important additional overnight segment in many national forests where seasonal homes are common (e.g., national forests located in the northern Great Lakes region) is seasonal homeowners visiting the national forest in conjunction with a trip to their seasonal home. Although these visitors behave more like local residents in their national forest recreation use, knowledge, and spending patterns than tourists, these visitors typically are best viewed as tourists and their spending typically does constitute "new" money for the purposes of local economic impact estimation.

Recent changes in the NVUM survey instrument should facilitate identifying the amount of recreation use associated with seasonal home users and their spending for the National Forest System.

Segmentation of forest recreation visitors is a productive approach for many management and planning decisions. The purpose of segments is to identify visitor subgroups that differ from one another on important variables. Although demographic and recreation activity segments are useful for some forest management decisions, they are of more limited use in analyzing visitor spending and economic impacts. Spending is more a function of trip types than activities.

In estimating spending and local economic impacts it is especially important to distinguish local visitors from tourists and day trips from overnight trips. These four segments also explain many other differences in awareness of forest recreation opportunities, use patterns, and likely responses to management alternatives. Because the local/nonlocal and day/overnight trip mix varies considerably from forest to forest and site to site, trip-type segments become as important for forest planning, if not more so, than traditional activity-based segments.

Additional research is needed to better understand the spatial variation in national forest recreation visitor spending, both between and within individual national forests. For example, research is needed to quantify the role of local economic conditions in influencing the spending of visitors to individual national forests. Within forests, there are opportunities to gain further insight into differences in spending patterns for visitors recreating at individual recreation sites and areas and the implications for local economic impact.

Endnotes

- [1] During the first 3 NVUM years, the specific trip expenditure question on the economic supplemental questionnaire asked the respondent to report his or her personal spending. Based on analyses described in another report available from the authors it was determined that this spending should be treated as the spending of the entire travel party. In the 4th year of round 1 the questionnaire was changed to explicitly gather the spending of the entire travel party.
- [2] Operationally, visitors were classified as local residents if the ZIP code of their residence (ZIP code centroid) was within 30 mi of the forest boundary. Beginning in 4th year of the

NVUM survey, visitors were asked how far they traveled to reach the site.

- [3] Arguments can be made for including spending by local visitors if in the absence of the forest recreation opportunities these visitors would travel outside the region.

Literature Cited

- ALWARD, G.A., J.R. ARNOLD, D.B.K. ENGLISH, AND D.W. MCCOLLUM. 1998. *Developing expenditure profiles for Forest Service recreation visitors*. Gen. Tech. Rep., unpublished draft. 30 p.
- BOWKER, J.M., D.B.K. ENGLISH, AND H.K. CORDELL. 1999. Projections of outdoor recreation participation to 2050. P. 323–351 in *Outdoor recreation in American life: A national assessment of demand and supply trends*, Cordell, H.K., C. Betz, J.M. Bowker, D.B.K. English, S.H. Mou, J.C. Bergstrom, R.J. Teasley, M.A. Tarrant, and J. Loomis. (eds.). Sagamore Publishing, Champaign, IL.
- BOWKER, J.M., J.C. BERGSTROM, AND J. GILL. 2007. Estimating the economic value and impacts of recreational trails: a case study of the Virginia Creeper Rail Trail. *Tour. Econ.* 13(2): 241–260.
- BRUNSON, M., AND B. SHELBY. 1991. Activity-related differences in campsite preference: Potential causes and implications for management. *West. J. Appl. For.* 6(3):78–81.
- BUIST, L.J., AND T.A. HOOTS. 1982. Recreation opportunity spectrum approach to resource planning. *J. For.* 80(2):84–86.
- CHRISTENSEN, H.H., P.J. WILLIAMS, AND R.N. CLARK. 1987. *Values and choices in outdoor recreation by male and female campers in dispersed recreation areas*. US For. Serv. Res. Pap. PNW-RP-377. 20 p.
- CROMPTON, J.L., S. LEE, AND T.J. SHUSTER. 2001. A guide for undertaking economic impact studies: The Springfest example. *J. Travel Res.* 40:79–87.
- DAIGLE, J.J., A.E. WATSON, AND G.E. HAAS. 1994. *National forest trail users: Planning for recreation opportunities*. US For. Serv. Res. Pap. NE-RP-685. 13 p.
- DONNELLY, M.P., J.J. VASKE, D.S. DERUITER, AND J.B. LOOMIS. 1998. Economic impacts of state parks: Effect of park visitation, park facilities, and county economic diversification. *J. Park Rec. Admin.* 16(4):57–72.
- DOUGLAS, A.J., AND D.A. HARPMAN. 1995. Estimating recreation employment effects with IMPLAN for the Glen Canyon dam region. *J. Environ. Manag.* 44:233–247.
- ENGLISH, D.B.K., AND J.M. BOWKER. 1996. Economic impacts of guided whitewater rafting: A study of five rivers. *Water Res. Bull.* 32(6): 1319–1328.
- ENGLISH, D.B.K., D.W. MARCOUILLER, AND H.K. CORDELL. 2000. Tourism dependence in rural America: Estimates and effects. *Soc. Nat. Res.* 13:185–202.
- ENGLISH, D.B.K., S.M. KOCIS, S.J. ZARNOCH, AND J.R. ARNOLD. 2002. *Forest Service National Visitor Use Monitoring process: Research method documentation*. US For. Serv. Gen. Tech. Rep. SRS-GTR-57. 14 p.

- FRECHTLING, D.C. 1978. A brief treatise on days and nights. *J. Travel Res.* 18(Fall):18–19.
- HUNT, J.D., AND D. LAYNE. 1991. Evolution of travel and tourism terminology and definitions. *J. Travel Res.* 29(4):7–11.
- JOHNSON, C.Y., AND J.M. BOWKER. 1999. On-site wildland activity choices among African Americans and white Americans in the rural south: Implications for management. *J. Park Rec. Admin.* 17(1):21–39.
- LEE, S.Y., J.F. PETRICK, AND J. CROMPTON. 2007. The roles of quality and intermediary constructs in determining festival attendees' behavioral intention. *J. Travel Res.* 45(4):401–412.
- OKU, H., AND K. FUKAMACHI. 2006. The difference in scenic perceptions of forest visitors through their attributes and recreational activity. *Landsc. Urban Plan.* 75:34–42.
- ROSENBERGER, R.S., AND J.B. LOOMIS. 2001. *Benefit transfer of outdoor recreation use values: A technical document supporting the Forest Service Strategic Plan (2000 revision)*. US For. Serv. Gen. Tech. Rep. RMRS-GTR-72. 59 p.
- ROSENTHAL, D.H., AND R.G. WALSH. 1986. Hiking values and the Recreation Opportunity Spectrum. *For. Sci.* 32(2):405–415.
- STYNES, D.J. 2005. *Economic significance of recreation uses of national parks and other public lands*. National Park Service Social Science Research Review 5(1). 35 p. Available online at www.nature.nps.gov/socialscience/pdf/SSRR_7.pdf; last accessed July 17, 2007.
- STYNES, D.J., E.M. WHITE, AND L.A. LEEFERS. 2003. *Spending profiles of national forest visitors, years 2000 and 2001*. Report to the US For. Serv., Department of Park, Recreation, and Tourism Resources, Michigan State University, East Lansing, MI. Available online at www.prr.msu.edu/stynes/nvum/NVUM2Year.pdf; last accessed Mar. 1, 2007.
- STYNES, D.J., AND E.M. WHITE. 2005a. *Spending profiles of national forest visitors, NVUM four-year report*. Report to the US For. Serv., Department of Park, Recreation, and Tourism Resources, Michigan State University, East Lansing, MI. Available online at www.fs.fed.us/recreation/programs/nvum/NVUM4YrSpending.pdf; last accessed Mar. 1, 2007.
- STYNES, D.J., AND E.M. WHITE. 2005b. *Effects of changes in the FY 2003 NVUM instrument and development of national forest visitor spending profiles for lodging-based segments*. Report to the US For. Serv., Department of Park, Recreation, and Tourism Resources, Michigan State University, East Lansing, MI. Available online at www.prr.msu.edu/stynes/nvum/NVUMFY2003report.pdf; last accessed Mar. 1, 2007.
- STYNES, D.J., AND E.M. WHITE. 2006. *Spending profiles for national forest recreation visitors by activity*. Report to the US For. Serv., Department of Park, Recreation, and Tourism Resources, Michigan State University, East Lansing, MI. Available online at www.fs.fed.us/recreation/programs/nvum/spending_profiles_2006.pdf; last accessed Aug. 3, 2007.
- SUN, Y.-Y., AND D.J. STYNES. 2006. A note on estimating visitor spending on a per day/night basis. *Tour. Manag.* 27(4):721–725.
- TRAVEL INDUSTRY ASSOCIATION OF AMERICA. 2005. *Impact of travel and tourism on the US and state economies*. Travel Industry Association of America, Washington, DC. 85 p.
- US DEPARTMENT OF INTERIOR, FISH AND WILDLIFE SERVICE AND US DEPARTMENT OF COMMERCE, CENSUS BUREAU (USDI FISH AND WILDLIFE SERVICE AND USDC CENSUS BUREAU) 2007. *2006 Survey of hunting, fishing, and wildlife-associated recreation*. Available online at www.library.fws.gov/nat_survey2006_final.pdf; last accessed Nov. 20, 2007.
- US DEPARTMENT OF TRANSPORTATION, BUREAU OF TRANSPORTATION STATISTICS. 1997. *1995 American Travel Survey: US Profile*. (BTS/ATS95-US). 16 p. Available online at www.bts.gov/publications/1995_american_travel_survey/us_profile/entire.pdf; last accessed Feb. 7, 2008.
- WATSON, P., J. WILSON, D. THILMANY, AND S. WINTER. 2007. Determining economic contributions and impacts: What is the difference and why do we care? *J. Reg. Anal. Policy* 37(2): 140–146.