

This article was downloaded by: [Lisa Chase]

On: 04 November 2011, At: 07:51

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Community Development

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rcod20>

### The Northern Forest Canoe Trail: economic impacts and implications for community development

Noah Pollock <sup>a</sup>, Lisa Chase <sup>b</sup>, Clare Ginger <sup>a</sup> & Jane Kolodinsky <sup>c</sup>

<sup>a</sup> Rubenstein School of Environment and Natural Resources,  
University of Vermont, Burlington, Vermont, USA

<sup>b</sup> Extension, University of Vermont, 11University Way, Brattleboro,  
VT, 05301, USA

<sup>c</sup> Department of Community Development and Applied Economics,  
University of Vermont, Burlington, VT, USA

Available online: 03 Nov 2011

To cite this article: Noah Pollock, Lisa Chase, Clare Ginger & Jane Kolodinsky (2011): The Northern Forest Canoe Trail: economic impacts and implications for community development, Community Development, DOI:10.1080/15575330.2011.583354

To link to this article: <http://dx.doi.org/10.1080/15575330.2011.583354>



PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

## The Northern Forest Canoe Trail: economic impacts and implications for community development

Noah Pollock<sup>a</sup>, Lisa Chase<sup>b\*</sup>, Clare Ginger<sup>a</sup> and Jane Kolodinsky<sup>c</sup>

<sup>a</sup>Rubenstein School of Environment and Natural Resources, University of Vermont, Burlington, Vermont, USA; <sup>b</sup>Extension, University of Vermont, 11 University Way, Brattleboro, VT 05301, USA; <sup>c</sup>Department of Community Development and Applied Economics, University of Vermont, Burlington, VT, USA

Recreation is increasingly promoted as a sustainable means of diversifying rural economies, yet few studies have explored how the characteristics of a recreational activity and its economic impact can vary significantly between communities. This research examined the economic impact of paddler recreation in six communities along the Northern Forest Canoe Trail. Results indicate that approximately 90,000 visitors paddled the waterways in 2006. Their spending created \$12 million in economic impacts, supporting about 280 jobs. However, economic impacts varied considerably between communities, due to differences in the number of users, trip lengths, lodging choices, group size, travel distances, and use of outfitters. This finding suggests that, while expenditures by visitors may help diversify local economies, community development practitioners and land managers must be cognizant of the conditions that facilitate visitor use and spending to ensure that potential economic benefits contribute positively to community development.

**Keywords:** applied economics; rural community development; rural economic development; tourism/recreation

### Introduction

Communities worldwide are turning toward recreation-based tourism as a tool for economic development (English, Marcouiller, & Cordell, 2000; Gartner, 1996). Rural areas have long been used for tourism and recreational activities; however, the economic role of tourism has expanded in recent years while other industries have declined (Cloke, 1993; Green & Dougherty, 2010; Towner, 1996). This approach to diversifying rural economies is favoured by government agencies, chambers of commerce, and advocacy groups as a positive contributor to quality of life for residents of rural communities (Chase, Boumans, & Morse, 2010; Ramaswamy & Kuentzel, 2005).

Recreation trails are an emerging approach to tourism development throughout the world, as nature and heritage-based recreation is seen as a source of jobs and income that creates few public or environmental burdens (Blakely & Bradshaw, 2002; Power, 1996; Reeder & Brown, 2005). While hiking trails such as the Inca Trail in Peru and the Appalachian Trail in the eastern United States have attracted

---

\*Corresponding author. Email: [lisa.chase@uvm.edu](mailto:lisa.chase@uvm.edu)

tourists for decades, other types of trails have been developed more recently, such as the Great Texas Coastal Birding Trail and the European Route of Industrial Heritage. Yet little information exists about how these trails create economic benefits in rural economies, and most economic impact studies are either focused on single recreation sites or are conducted at too large of a scale to capture sub-regional differences. Therefore, policy-makers and community development practitioners may hold incomplete and rudimentary perspectives that fail to take account of the suite of context-specific variables that drive the actual economic impacts of recreation. This paper examines the Northern Forest Canoe Trail (NFCT) as a case study to identify the factors that affect a recreation trail's economic benefits and to demonstrate how sub-regions can experience and respond to a regional recreational resource differently.

The NFCT is a 740-mile canoe and kayak route that traverses the Northern Forest, a 26-million-acre bioregion extending across northern New York and New England. The trail follows waterways historically used by Native Americans and early settlers, and passes through both remote wilderness and populated areas (NFCT, 2006). Since 2000 the Northern Forest Canoe Trail association has been developing campsites, signage, portage trails, and promoting the trail in the media. Community involvement is a key part of trail development and, similar to community development efforts throughout the USA, multiple participation tools have been used to gather input and involve stakeholders (Chase, Amsden & Phillips, 2011). The association has found that in several Northern Forest communities there is a marked variation in both the recreation infrastructure in place and the perceptions of the value that nature-based tourism can bring to their communities.

### *Conceptualizing economic impacts*

Economic impact analysis measures commerce attributable to recreational activities to determine effects in local economies (Clope, 1993; Douglas & Harpman, 1995; Stynes, 1999). Visitors drawn to an area for its recreational resources spend money for goods and services. Their expenditures circulate among businesses before leaving the local economy (Blakely & Bradshaw, 2002; Power, 1996).

Input–output models, which combine visitor expenditure data with regional, industry-specific multipliers, are a tool for estimating economic impacts (Blakely & Bradshaw, 2002). They quantify indirect and induced impacts by calculating the “multiplier effect,” or the degree of monetary recirculation within the local economy. While concerns exist regarding the tendency of input–output models to overstate multipliers, appropriate corrections can be applied (Loomis, 2007).

Several input–output models have been developed for trails and park economic impact studies, including the Money Generation Model (MGM2), developed by the National Park Service, and IMPLAN, developed by the United States Forest Service and then MIG, Inc. (Douglas & Harpman, 1995). Input–output models also estimate the number of jobs and personal income supported by visitor expenditures.

### *Factors influencing economic impacts*

A review of previous studies suggests that the characteristics of a recreational activity significantly affect the economic impacts in local communities. Relevant variables appear to be the number of visitors, the mix of local and non-local users, the

quantity and pattern of visitor expenditures, and the degree of multiplication and leakage within the local economy.

The volume of visitors is a significant driver of economic impacts. For example, Blank and Simonson (1982) estimated that 12,000 paddlers visiting the Crow River in Wisconsin contributed \$148,000 to the local economy in one season. In contrast, an estimated 76,750 paddlers visited a comparably sized section of the upper Delaware River, and contributed about \$2.1 million to local economies (Cordell, Bergstrom, Ashley, & Karish, 1990).

The percentage of local users must also be considered. A study of three rail trails indicated that trails used predominately by local day users have lower economic impacts than those used by tourists (Moore, Graefe, Gitelson, & Porter, 1992). In addition, expenditures by local residents is generally not considered as creating economic impacts because their expenditures are considered “a recirculation of money within the existing local economy” (Crompton, 2006; Stynes, 1999).

Recreational areas also differ in the types of users they attract, best characterized by their choice of accommodation, the use of guiding services, trip lengths, group sizes, travel distances, and visitor income levels (English & Bowker, 1996; Moore & Barthlow, 1998; Stynes, 1999). Because of these differences, visitor expenditures can vary widely between recreational areas. Hjerpe and Kim (2007) estimated that Grand Canyon river runners spend \$680 per person, per trip, in the local communities. New River Gorge paddlers, on the other hand, spend an average of \$31 per person, per trip (Manni, Littlejohn, & Hollenhorst, 2005). Thigpen, Avant, and Siderelis (2001) reported a wide range in average expenditure levels in their nine study regions, due to a mix of visitor types.

Overnight users often have significantly greater impacts than day users. Bowker, Bergstrom, and Gill (2007) reported that Creeper Trail day users spent \$12 per person per trip in local communities, while overnight users spent \$87. Schutt (1997) reported relatively low average expenditures for Bruce Trail hikers, a 725-km trail that traverses the Niagara Escarpment in Ontario. Most hikers are day users, spending an average of \$25.26 per user, or \$75.77 per group per trip. Finally, in a survey of Appalachian Trail users, researchers found that overnight hikers spent almost three times as much on their trips as day users (Manning et al., 2000).

The characteristics of the local community and visitors' expenditures also affect economic impacts, represented by the “multiplier effect”. Multiplier effects are driven by several factors, including the types of visitor expenditures. For example, expenditures on gasoline lead to little indirect and induced spending, as fuel is not produced or processed locally. Expenditures at local restaurants and guide services have higher multiplier effects, primarily due to the labour-intensive nature of those industries. Of secondary importance is the character of the local economy. In general, more opportunities exist for induced and indirect spending in larger and more urbanized economies, while rural areas have higher job-to-sales ratios (Stynes, Propst, Chan, & Sun, 2000). In addition, communities with recreational resources served primarily by visitors employing non-local outfitters can experience few economic benefits while bearing social and environmental impacts (Hjerpe & Kim, 2007).

Tourism demand models propose that a combination of attractions, promotion, adequate transportation networks, available information, and services drive the popularity of a destination (Gunn & Var, 2002). The wide range of recreational trip

characteristics, visitation patterns, and resulting economic impacts reported in the literature suggests that a simplified view of a recreational resource's economic impacts can fail to capture potentially significant sub-regional differences. Yet these variations may have important implications for land management and economic development. This is particularly important in the context of a linear trail that depends on acceptance of the resource across different sub-regions for its existence. Effective approaches to developing and supporting such resources may need to incorporate a range of messages, monitoring, and management actions that are tailored to the conditions and needs of each sub-region. To test the relevance of this proposition, this research quantifies the variations in trip and visitor characteristics and economic impacts in different regions along the NFCT.

This study focused on six distinct sub-regions of the NFCT: the Fulton chain of lakes and sections of the Raquette River in the Adirondack Park, New York; the Missisquoi River delta in northwestern Vermont; 38 miles of the Clyde, Nulhegan, and Connecticut Rivers in Vermont's Northeast Kingdom; the 13 Mile Woods section of the Androscoggin River, near Errol, New Hampshire; Rangeley Lake, Maine; and the Allagash Wilderness Waterway, Maine (Figure 1). To examine the importance of sub-regional differences, regions were selected with the assistance of NFCT staff and local land managers to create a sample with a diversity of waterway characteristics, a range of visitation rates, and varying levels of tourism infrastructure, and degree of promotion in the media.

The Adirondacks study region contains three public campgrounds, dozens of remote campsites, over 50 lodging establishments, and five canoe outfitters. Tourism is the primary industry in the region and ample goods and services are available for visitors. Paddling opportunities are well promoted in the media.

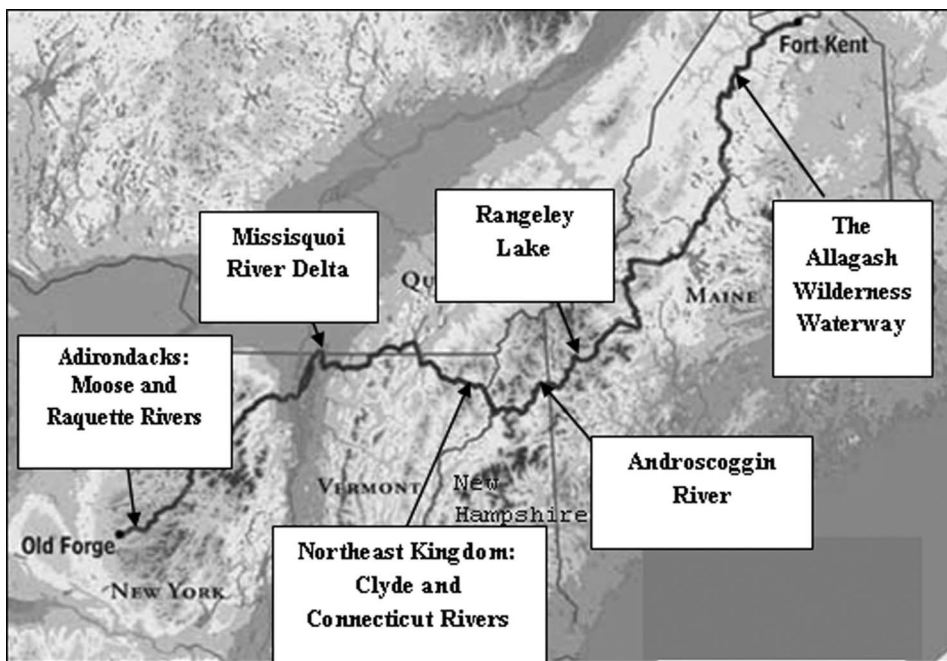


Figure 1. Study regions along the Northern Forest Canoe Trail.

The Missisquoi River study region is protected as part of the US Fish and Wildlife Service's Missisquoi Wildlife Refuge. While camping, lodging, and outfitter services are nearby, none are directly on the waterway in this 10-mile section. Unlike the Adirondacks study region, tourism does not play prominently in the area's economy.

In the Clyde, Nulhegan, and Connecticut Rivers study region, the trail winds through a mosaic of farms, forests, and boreal wetlands. Two campgrounds, two remote campsites, and two lodging establishments are located along the waterway. While regional chambers of commerce promote this region as a tourism destination, this region is not broadly recognized for its paddling opportunities.

The Androscoggin River study region is marked by Class I and Class II whitewater flowing through the designated "13-Mile Woods" recreation area. This section, well established as a paddling destination, includes several hotels, outfitters, campgrounds, and remote campsites. The region is sparsely populated, with significant land area preserved in national and state forest.

Eleven miles in length, Rangeley Lake is a large body of water bordered by a mix of protected wetlands and forests, a state park, hotels, and rental cabins. It is a well-marketed tourist destination, with 13% of the work force directly employed in arts, entertainment, recreation, accommodation and food services (Census, 2000).

The remote Allagash Wilderness Waterway section is 90 miles of undeveloped shoreline owned by the state of Maine, which maintains dozens of primitive campsites. The Allagash is widely recognized as a premier location for wilderness paddling, with the vast majority of users embarking on multi-day camping trips.

### Research methods

A half-page paddler intercept survey was used to acquire data on visitation rates, trip characteristics, and visitor expenditures. To efficiently obtain a comprehensive and representative sample, multiple methods were used to distribute the survey to paddler groups, including boat launch registration kiosks, in-person surveys administered by campground staff and researchers, and mail-back surveys.

Registration kiosks were the primary method for survey distribution. Seventeen kiosks were installed at public boat launches in each study region during the second week of June 2006. A display contained information on the research study and the canoe trail as well as a paddler map. Over the course of the season, paddlers using the kiosks completed 885 usable surveys.

To estimate registration rates, boat launches were observed on 25 days throughout the paddling season. Observations were made on both weekdays and weekends. Monitoring effort was proportional to use patterns and levels, and each boat launch was observed for one to three days. All groups returning from a paddling trip were asked if they had completed the survey. The registration rate was estimated to be 35% ( $n = 78$ ). To check for non-response biases, all non-registering groups were also asked to complete an in-person survey, with a 98% response rate ( $n = 54$ ).

Responses were compared between self-registering and non-registering groups. No significant difference was found between trip expenses, group sizes, travel times, or median household income levels. However, self-registering groups ranked their knowledge of the NFCT higher ( $z = 2.7, p < 0.01$ ), and were twice as likely to report the NFCT as a reason for their trip ( $z = -4.39, p < 0.01$ ). For these variables, correcting weights were assigned to the sample of non-registering groups.

Surveys were also administered directly by staff at several campgrounds. Staff were asked to distribute the survey to every paddling group entering the park. Groups were identified by the presence of canoes or kayaks on top of their vehicle, and surveys were completed during the campsite registration process. In practice, not every paddler group was asked to complete the survey. However, when approached, sampled groups were willing to participate about 90% of the time ( $n = 51$ ).

Following a procedure used by Daigle (2004), surveys were distributed to paddlers at two North Maine Woods checkpoints. Staff were asked to distribute the survey to every paddler group whose destination was the Allagash Wilderness Waterway. A letter describing the study and a self-addressed, stamped envelope were provided with each survey. One hundred and eighty-nine surveys were distributed in this manner. While the response rate (21%) and sample size ( $n = 40$ ) were relatively low, paddler demographics and trip characteristics were similar to those reported in previous studies of Allagash paddlers (Daigle, 2004).

All surveys were checked for completeness and consistency. Attempts were made to contact respondents to clarify responses with inconsistencies relating to trip lengths, accommodation types, and expense estimates. Questionable surveys that could not be clarified were excluded from the data analysis.

In-person interviews were conducted with managers of lodging establishments and campgrounds with waterway access to obtain an estimate of the number of paddler groups entering the waterways via staffed locations. A list of all lodging establishments with water access was tabulated and sorted into four geographic locations. Every other lodging establishment from this list was chosen for a study sample. A mail-back questionnaire was distributed to gather detailed quantitative data. Follow-up telephone calls were conducted in November to obtain end-of-season use data as needed from the campgrounds. A total of 37 lodging and campground surveys were completed, with a response rate of 77%.

Using the surveys completed at registration kiosks, visitation rates were estimated by dividing the number of paddling trips reported by the registration, valid response, and operational kiosk rates. The valid response rate is the percentage of completed surveys that had the necessary responses to conduct this analysis. Operational kiosk rates were region-specific calculations of the percentage of the season kiosks that were fully operational.

Data obtained in the lodging and campground surveys were used to estimate the number of lodging and campground users in the Adirondack and Rangeley Lake study regions. At lodging establishments, the methodology was customized based on the data availability of each establishment. At campgrounds, visitation estimates were calculated by multiplying staff estimates of the proportion of campers and day users that were paddlers by the number of camping and day user groups recorded using the facility over the course of the 2006 season. North Maine Woods also keeps records of all the number of groups using the Allagash Wilderness Waterway. These records were subdivided into the different user types by using the proportions established through the paddler survey.

As paddler surveys were primarily administered at public boat launches, groups staying in area hotels, rental cabins, and campgrounds were under-represented. In visitor economic impact studies, weighting survey results is often necessary to avoid biased estimates of key demographic and economic variables due to sampling procedures (Wilton & Nickerson, 2006). To correct for these biases, a system of weights was assigned to each user group, within each region, by first dividing the

total number of estimated groups by the number of groups in the sample, and then rescaling these values to reflect the actual sample size.

Survey respondents provided information on their home town, Based on their responses, users were classified as local users or non-local users. Local users were defined as groups travelling less than 25 miles to reach the waterway. Groups were further differentiated based on trip length, and types accommodation utilized while in the region:

- *Local day users*: visitors with a residence within 25 miles of the waterway.
- *Non-local day users*: paddlers with a residence further than 25 miles from the waterway, on a day trip to the region.
- *Second-home owners*: visitors staying at a vacation home situated within 25 miles of the waterway, or staying, as a guest, with local residents.
- *Hotel, cabin renters*: visitors staying in a hotel, motel, or vacation cabin rental.
- *Campground campers*: visitors staying in a front country public or private campground.
- *Canoe campers*: visitors staying at backcountry campsites, reached by boat.
- *Guided campers*: campers on a backcountry trip led by professional guides.

The MGM2 was used to model economic impacts of visitor spending. This program, developed by Michigan State University in conjunction with the National Park Service, is a spreadsheet-based program that includes generic multipliers that control for the study area's geographical and demographic characteristics (Stynes et al., 2000).

To quantify sub-regional characteristics, univariate and bivariate analyses were conducted using the statistical software package SPSS 14.0. Chi-square, median, Kruskal–Wallis, and Mann–Whitney tests were conducted to assess variation in group composition, user types, trip lengths, and travel times among study regions. Lambda and phi coefficients were used to determine the strength of any significant relationship.

A Tobit regression model was used to help identify which variables were significant in explaining variations in group expenditures. The Tobit model, developed by J. Tobin in 1958, is a two-stage regression that assesses the importance of independent variables in driving a dependent variable only when the dependent variable is greater than zero (Tobin, 1958). This model, useful for censored samples with a dataset containing zero values, was chosen since over 15% of the groups reported no expenditures in local communities.

## Findings

Results indicate the presence of substantial variation among the six study regions with respect to trip characteristics, associated use levels, and user types. These variations are reflected in economic impacts that differ by region.

### *Variations in trip characteristics, use levels, and user types*

Trip characteristics differed significantly between regions ( $n = 952$ ,  $p < 0.001$ ). Small adult groups and solo paddlers were prevalent in the Missisquoi. In contrast, Rangeley Lake, the Adirondacks, and the Northeast Kingdom had a wide range in



group compositions. The Androscoggin and the Allagash were more popular with large youth groups than other regions. This is probably due to the abundance of primitive campsites along these waterways and ample opportunities for extended, multi-day trips.

Results also indicate a variation in the trip lengths between regions ( $n=954$ ,  $p < 0.001$ ). While the median length of stay in the region was three days (mean = 3.6, 95% confidence interval = 3.4–3.8), Allagash visitors had the highest average trip lengths, followed by paddlers visiting Rangeley Lake, the Adirondacks, the Androscoggin, the Northeast Kingdom, and the Missisquoi ( $z = -7.6$ ,  $p < 0.01$ ).

Across all regions, an estimated 22,074 groups (89,399 users) paddled the waterways (Table 1). Measured in user-days, the Adirondacks received the heaviest use, followed by the Allagash, the Northeast Kingdom, Rangeley Lake, the Androscoggin, and the Missisquoi River. Standardized by waterway miles, Rangeley Lake and the Adirondacks have the highest use intensity, due to the abundance of state campgrounds and waterway lodging establishments.

As shown in Table 2, user types varied significantly between regions ( $n=965$ ,  $p < 0.01$ ). In the Adirondacks, the majority of users stayed at campgrounds, hotels, and cabins. A similar pattern is found at Rangeley Lake, although a higher proportion (52.3%) of users rented hotel rooms and cabins than in any other study region. While the Clyde and the Connecticut Rivers in the Northeast Kingdom attracted a variety of users, they also had the highest proportion (36.7%) of local paddlers. The Androscoggin attracted a wide diversity of users, with campers predominating, but very few local day users. Allagash paddlers sought a remote

Table 1. User numbers across study regions.

Region	Groups	Users	User-days	Average group size Trail miles	User-days/ mile	
All areas	22 074	3.8	89 399	329 881	219	1510
Adirondacks	7889	3.8	27 374	104 020	58	1809
Missisquoi	888	2.7	2424	15 345	10	1535
Northeast Kingdom	4686	3.8	16 870	55 504	33	1682
Androscoggin	1799	7.1	13 939	24 255	17	1427
Rangeley Lake	2834	3.1	8503	25 340	11	2304
Allagash	3978	5.2	20 565	86 785	90	964

Table 2. Variation in user types across study regions.

Study region	Local day users (%)	Non-local day-users (%)	Canoe campers (%)	Hotel/cabin renters (%)	Campground campers (%)	Second-home owners, guests (%)
Adirondacks	0	4	17	41	35	3
Missisquoi River	12	47	0	11	26	4
Northeast Kingdom	38	6	4	6	21	25
Androscoggin River	0	7	13	0	78	2
Rangeley Lake	1	4	3	52	25	15
Allagash Waterway	0	0	90	0	10	0

experience; 90% of the respondents were canoe campers. The Missisquoi was dominated by non-local day users, who made up 46% of the paddler groups. None of the respondents in this region were canoe campers.

### *Economics variations*

While the average paddler group reported spending \$343–416 within 25 miles of the waterway during the duration of their trip, or \$39 per person per day, expenditures varied significantly between user types and regions ( $n=831$ ,  $p < 0.001$ ). Local groups spent a mean of \$12–28, or \$5 per person per day; non-local groups spent a mean of \$414–498, or \$46 per person per day. Guided campers (\$564–936) and hotel/cabin renters (\$613–929) had the highest expenditures, followed by campground campers (\$282–392), canoe campers (\$166–240), second-home owners (\$181–309), non-local day users (\$29–73) and local day users (\$9–29). Allagash respondents had the highest expenses, followed by Rangeley Lake, the Adirondacks, the Northeast Kingdom, the Androscoggin, and the Missisquoi ( $z = 3.63$ ,  $p < 0.001$ ) (Table 3).

The results of the Tobit regression analysis provide further evidence that trip lengths, travel distance, and the use of hotel or cabins, guides or outfitters are significant variables in explaining total trip expenses, explaining about one-third of the variation ( $r^2 = 0.27$ ). Group size, household income, and the number of annual paddling trips in the region were not significant variables (Table 4).

Based on the MGM2 model, an estimated \$8.8 million was spent in local economies by paddlers in the six study regions. After accounting for multiplier effects, these expenditures created \$6.6 million in value added to the local economy, supported an estimated 283 jobs and provided \$4.1 million in personal income. Table 5 summarizes the economic impacts in each study region. Total impacts were greatest in the Adirondacks, Rangeley Lake, and the Allagash due to high visitation by non-local paddlers on overnight trips in the region. Local communities in the Northeast Kingdom, and near the Androscoggin received modest benefits from paddler tourism and recreation. Due to relatively low use levels, particularly among tourists, paddlers on the Missisquoi contributed the least, even after accounting for variations in the size of the study regions.

### **Discussion and conclusions**

The results of this study indicate that paddler recreation and tourism is currently supporting a modest number of jobs in local economies along the NFCT. However, intra-regional variation in impacts is significant; paddler recreation in the Adirondack study site has a 100-fold greater impact than recreation along the Missisquoi River. The NFCT study sites span the known range of average trip expenses across paddler studies in several other locations (Figure 2). Variations in visitor numbers, user types, trip characteristics, and expenditure patterns appear to be driving these differences along the NFCT.

Local communities have a key role to play in guiding the development of regional trail systems. Building campsites, developing new access points, permanently protecting river corridors, hosting canoe races and boat festivals, and promoting recreational opportunities in the media are largely locally driven efforts. The degree to which communities choose to embrace various implementation strategies may shape resulting economic impacts. The greatest impacts may come with

Table 3. Mean expenditures per group per trip.

Expense category	Adirondacks	Missisquoi River	Northeast Kingdom	Androscoggin River	Rangeley Lake	Allagash	All regions
Lodging	\$235.16 (\$29.13)	\$17.44 (\$13.25)	\$17.68 (\$9.32)	\$94.55 (\$15.86)	\$181.40 (\$24.33)	\$68.92 (\$6.42)	\$127.86 (\$11.06)
Restaurants	\$81.11 (6.14)	\$12.85 (\$4.29)	\$13.03 (\$2.85)	\$14.24 (\$3.05)	\$94.86 (\$10.41)	\$54.93 (\$3.73)	54.62 (\$2.88)
Groceries	\$45.79 (\$4.13)	\$13.96 (\$6.74)	\$20.95 (\$4.07)	\$68.07 (\$11.50)	\$83.19 (\$9.28)	\$62.30 (\$7.85)	\$48.69 (\$2.80)
Transportation	\$36.33 (\$3.76)	\$8.11 (\$3.06)	\$10.96 (\$2.32)	\$46.65 (\$7.38)	\$39.19 (\$4.04)	\$159.81 (\$10.12)	\$54.13 (\$3.07)
Access fees	\$2.20 (\$0.59)	\$0.24 (\$0.44)	\$0.30 (\$0.31)	\$2.26 (\$1.28)	\$0.49 (\$0.21)	\$97.56 (\$8.18)	\$19.27 (\$2.01)
Guides, outfitters	\$18.30 (\$4.92)	\$1.03 (\$1.17)	\$1.78 (\$2.59)	\$3.39 (\$1.63)	\$0.76 (\$0.76)	\$266.69 (\$85.75)	\$56.70 (\$16.4)
Other retail	\$37.50 (\$6.97)	\$3.44 (\$2.59)	\$10.86 (\$4.90)	\$12.28 (\$3.35)	\$27.07 (\$4.58)	\$25.97 (\$4.38)	\$24.57 (\$2.82)
Entertainment	\$7.56 (\$1.44)	\$0.12 (\$0.22)	\$1.19 (\$0.58)	\$0.00 (\$0.00)	\$14.24 (\$3.23)	\$0.00 (\$0.00)	\$4.69 (\$0.68)
Other	\$7.95 (\$2.56)	\$0.00 (\$0.00)	\$6.84 (\$2.28)	\$14.85 (\$7.49)	\$3.42 (\$3.74)	\$32.67 (\$8.28)	\$11.77 (\$1.99)
Total expenses	\$470.45 (\$37.40)	\$56.76 (\$21.62)	\$83.44 (\$17.16)	\$255.58 (\$31.93)	\$443.92 (\$39.21)	\$750.35 (\$93.23)	\$400.34 (\$24.18)
<i>n</i>	430	68	171	34	95	33	831

Note: Standard errors are in italics.

Table 4. Results of Tobit regression analysis.

Variable	<i>b</i>	<i>p</i> value
Trip lengths	50.15	0.00
Travel distance (miles)	0.099	0.02
Hotel/cabin renters	496	0.00
Guide/outfitter users	278	0.00
Household income	0.09	0.75
Number of paddling trips	-2	0.26
Group size	4.12	0.28

Table 5. Economic impacts of visitor spending across study regions.

Study region	Trail miles	Output/sales (x \$1000)	Personal income (x \$1000)	Value added (x \$1000)	Total jobs	Income per trail mile (x \$1000)
All regions	219	12 039	4143	6626	283	18.96
Adirondacks	58	6089	2104	3342	134	36.59
Missisquoi	10	64	21	33	2	2.10
Northeast Kingdom	33	557	195	305	15	5.91
Androscoggin	17	452	156	252	12	9.18
Rangley Lake	11	1919	624	998	51	56.73
Allagash	90	2958	1043	1696	69	11.59

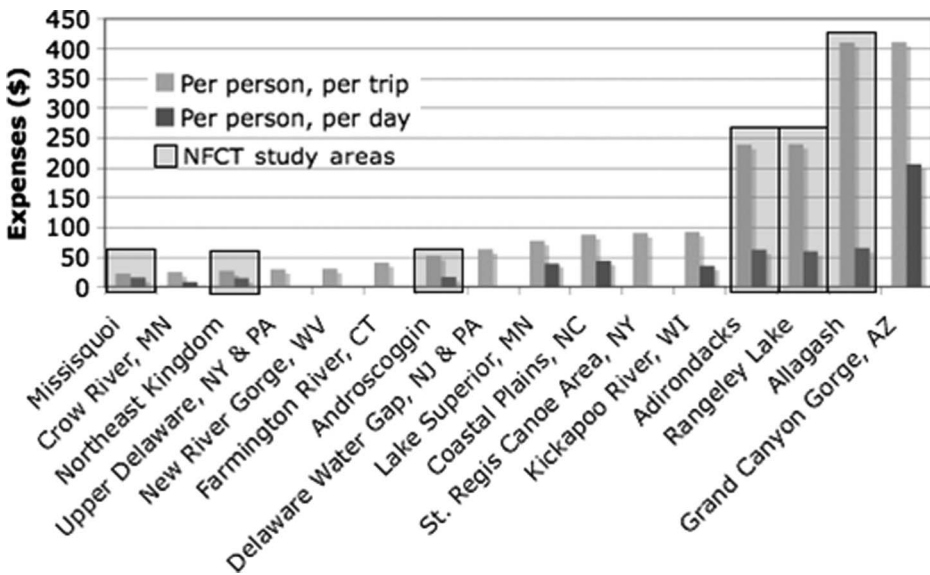


Figure 2. Average trip expenses across paddler studies.

Note: All expenses are in 2006 US dollars. Data for non-NFCT waterways are from Cordell et al. (1990), Blank and Simonson (1982), National Park Service (2005), LSWT (2001), Thigpen et al. (2001), Omohundro (2002), Anderson et al. (1999), and Stynes and Sun (2005).

a coordinated approach serving as a component of a larger, more regional tourism development strategy that reflects the economic realities of paddler spending profiles.

Variations in the types of users drive regional differences in economic impacts. Overnight visitors outspend day users by 10:1, and hotel and cabin renters spend about twice as much as campers. The Missisquoi River and the Clyde and Connecticut were predominately visited by day users while the Adirondacks, the Androscoggin, Rangeley Lake, and the Allagash are better established as destinations for overnight trips to the region. As such, communities seeking to draw overnight visitors could consider developing new campsites and other lodging options in regions where opportunities are scarce.

The Tobit regression analysis demonstrated that the use of guide and outfitter services significantly affects both the probability of making expenditures and the total group expenditures. Due to its remote, linear nature, a higher percentage of Allagash paddlers enlist the services of guides and outfitters than in any other region along the canoe trail. A well-established state-licensing programme also gives Maine guides significant credibility. A searchable, online database makes it easy for visitors to contact licensed guides. While other states have guide associations, they do not carry the same cachet as Maine's guides. In the Adirondacks and on Rangeley Lake, families staying in lakeside cabins provide the majority of outfitters' business. In other regions there is a paucity of canoe rental services and shuttling primarily due to low demand and high labour and insurance costs. Communities lacking outfitters could consider encouraging non-local outfitters to expand their services through partnerships with existing lodging and retail establishments.

Economic impacts must be considered within regional social and economic contexts (Alavalapati & Adamowicz, 2000). While the total economic impacts were modest in the Androscoggin, due to the region's sparse population, local business owners indicated that visitors accounted for the majority of their customer base. In other regions, total impacts remain small relative to the regional economy. In particular, the higher population in the Missisquoi River gateway communities dilutes paddlers' economic impacts. Similar results were found in other studies; in the North Carolina coastal plains, for example, the estimated \$55 million in paddler economic impacts represented only 4% of the estimated impacts of tourism in the region (Thigpen et al., 2001).

The canoe trail can serve as a tool for community economic development by bringing new paddlers to the region and by changing the trip patterns of current users within sub-regions. Other studies have documented changes in economic impacts as a region's recreational resources became increasingly utilized. Between 1994 and 1999, angler expenditures on the Kickapoo River in Wisconsin rose by 50–80%, and the average paddler trip length increased by 0.3 days. Notably, there was a 600% increase in the use of overnight lodging (Anderson, Hewitt, & Marcouiller, 1999).

The NFCT may impact the distribution of paddlers across the areas' waterways, decreasing the significant sub-regional variations. By providing maps, portage trails, campsites, and signage in relatively unknown regions, the NFCT may shift some recreation from more popular areas to the lightly used waterways, increasing economic benefits in regions not currently affected by paddler recreation and tourism.

This research examined the impacts paddler tourism and recreation have on the Northern Forest with the primary goal of helping communities, businesses, and

stewardship organizations form realistic expectations of the benefits for local economies. Results indicate the presence of significant sub-regional variations in visitation rates, trip characteristics, and resulting economic impacts. This variation has important implications for regional land managers and community development practitioners planning linear recreational networks that span a variety of sub-regions with differing use characteristics and economic impacts.

The recent formation of the NFCT provides a unique opportunity to study community change early in the process and to measure the impacts of recreation trail development. Continued sub-regional monitoring will shed insights on how communities respond differently to the opportunities and challenges that the trail presents. These insights will be relevant for regional land managers, community development practitioners, and policy-makers seeking a more sophisticated understanding of the implications of recreation trails for community development in rural areas.

### Acknowledgements

The authors acknowledge the Northeastern States Research Cooperative for funding the research and the Northern Forest Canoe Trail staff for their collaboration throughout the project.

### References

- Alavalapati, J.R., & Adamowicz, W.L. (2000). Tourism impact modeling for resource extraction regions. *Annals of Tourism Research*, 27(1), 188–202.
- Anderson, A., Hewitt, L., & Marcouiller, D. (1999). *Outdoor recreation, community development, and change through time: A replicated study of canoeing and angling in Southwestern Wisconsin*. Wisconsin: Southwestern Wisconsin University of Wisconsin-Cooperative Extension, Center for Community Economic Development.
- Blakely, W., & Bradshaw, T. (2002). *Planning local economic development* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Blank, U., & Simonson, L. (1982). *Recreational resource use: Who gains? Who pays? The Crow Wing Canoe Trail case*. Minnesota: Department of Agriculture and Applied Economics, University of Minnesota.
- Bowker, J.M., Bergstrom, J.C., & Gill, J. (2007). Estimating the economic value and impacts of recreational trails: A case study of the Virginia Creeper Trail. *Tourism Economics*, 13(2), 241–260.
- Census. (2000). American fact finder. United States Census Bureau. Retrieved November 5, 2007 from <http://factfinder.census.gov/>
- Chase, L.C., Amsden, B., & Phillips, R.G. (Forthcoming 2012). Stakeholder engagement in tourism planning and development, Chapter 27 in Muzaffer Uysal, Richard R. Perdue, and Joseph Sirgy (eds.), *Handbook on Tourism and Quality of Life Research*. New York, NY: Springer Publishing Company.
- Chase, L.C., Boumans, R., & Morse, S. (2010). Participatory modeling as a tool for community development planning: Tourism in the Northern Forest. *Community Development: Journal of the Community Development Society*, 41(3), 385–397.
- Cloke, P. (1993). The countryside as commodity: New spaces for rural leisure. In S. Glyptis (Ed.), *Leisure and the environment* (pp. 53–70). New York: Belhaven Press.
- Cordell, H.K., Bergstrom, J.C., Ashley, G.A., & Karish, J. (1990). Economic effects of river recreation on local economies. *Water Resources Bulletin*, 26(1), 53–60.
- Crompton, J. (2006). Economic impact studies: Instruments for political shenanigans? *Journal of Travel Research*, 45(1), 67–82.
- Daigle, J. (2004). *Allagash wilderness waterway visitor survey technical report*. Orono, ME: University of Maine, Department of Forest Management Parks, Recreation and Tourism Program.
- Douglas, A., & Harpman, D. (1995). Estimating recreation employment effects with IMPLAN for the Glen Canyon Dam region. *Journal of Environmental Management*, 44, 233–247.

- English, D.K., & Bowker, J.M. (1996). Economic impacts of guided whitewater rafting: A study of five rivers. *Water Resources Bulletin*, 32(6), 1319–1328.
- English, D.K., Marcouiller, D.W., & Cordell, H.K. (2000). Tourism dependence in rural America: Estimates and effects. *Society and Natural Resources*, 13(3), 185–202.
- Gartner, W. (1996). *Tourism development: Process, principles, and policies*. New York: Van Nostrand Reinhold.
- Green, G.P., & Dougherty, M.L. (2010). Localizing linkages for food and tourism: Culinary tourism as a community development strategy. *Community Development: Journal of the Community Development Society*, 39(3), 148–158.
- Gunn, C., & Var, T. (2002). *Tourism planning: Basics, concepts, cases*. London: Routledge.
- Hjerpe, E., & Kim, Y. (2007). Regional economic impacts of Grand Canyon river runners. *Journal of Environmental Management*, 85, 137–140.
- Loomis, J.B. (2007). Correcting for on-site visitor sampling bias when estimating the regional economic effects of tourism. *Tourism Economics*, 13(1), 41–47.
- LSWT. (2001). *Survey of sea kayak owners in Minnesota: Kayaking the north shore of Lake Superior*. Minnesota: Minnesota Department of Natural Resources Division of Parks and Recreation, Trails and Waterways Division.
- Manni, M., Le, Y., Littlejohn, M.A., & Hollenhorst, S. (2005). *New River Gorge National River Visitor Study – Summer 2004* (National Park Service Social Sciences Program). Washington DC: National Park Service.
- Manning, R., Valliere, W., Bacon, J., Graefe, A., Kyle, G., & Hennessey, R. (2000). *Use and users of the Appalachian Trail: A source book*. Washington DC: National Park Service.
- Moore, R., & Barthlow, K. (1998). *The economic impacts and users of long-distance trails: Featuring a case study of the Overmountain Victory National Historic Trail*. Washington, DC: US Department of the Interior, National Park Service.
- Moore, R., Graefe, A., Gitelson, R., & Porter, E. (1992). *The impacts of rail-trails: A study of the users and property owners from three trails*. Washington, DC: National Park Service, River, Trails, and Conservation Assistance Program.
- Northern Forest Canoe Trail. (2006). *The Northern Forest Canoe Trail: Trail overview*. Retrieved from <http://www.northernforestcanoetrail.org/>
- National Park Service. (2005). *Appalachian national scenic trail strategic plan*. Washington DC: Appalachian Trail Park Office.
- Omohundro, J.T. (2002). Expenditures by nonmotorized recreationists in the Adirondack Park. *Adirondack Journal of Environmental Studies*, 9(1), 27–35.
- Power, T. (1996). *Lost landscapes and failed economies: The search for a value of place*. Washington, DC: Island Press.
- Ramaswamy, V., & Kuentzel, W. (2005). Rural restructuring and the transition of a tourism dependent community. *Tourism Analysis*, 3, 63–76.
- Reeder, R.J., & Brown, D.M. (2005). *Recreation, tourism, and rural well-being*. Washington DC: United States Department of Agriculture Economic Research Service.
- Schutt, A. (1997). *The Bruce Trail, Ontario users and their economic impact* (master's thesis). Trent University, Ontario, Canada.
- Stynes, D.J. (1999). *Guidelines for Measuring Visitor Spending*. East Lansing, MI: Michigan State University, Department of Park, Recreation and Tourism Resources.
- Stynes, D.J., Propst, D.B., Chang, W., & Sun, Y. (2000). *Estimating national park visitor spending and economic impacts: The MGM2 model*. Idaho: University of Idaho, National Park Service Cooperative Park Studies Unit.
- Stynes, D.J., & Sun, Y. (2005). *Economic impacts of Grand Canyon National Park visitor spending on the local economy*. Washington, DC: National Park Service Social Science Program.
- Thigpen, J., Avant, B., & Siderelis, C. (2001). *North Carolina Coastal Plains Paddle Trails Initiative: The state of North Carolina coastal paddling survey*. Raleigh, NC: North Carolina Sea Grant.
- Tobin, J. (1958). Estimation of relationships for limited dependent variables. *Econometrica*, 26, 24–37.
- Towner, J. (1996). *An historical geography of recreation and tourism in the western world 1540–1940*. New York: John Wiley and Sons.
- Wilton, J., & Nickerson, N. (2006). Collecting and using visitor expenditure data. *Journal of Travel Research*, 45, 17–25.