

The Economic Impacts of Whitewater Boating on the West River Jamaica, Vermont



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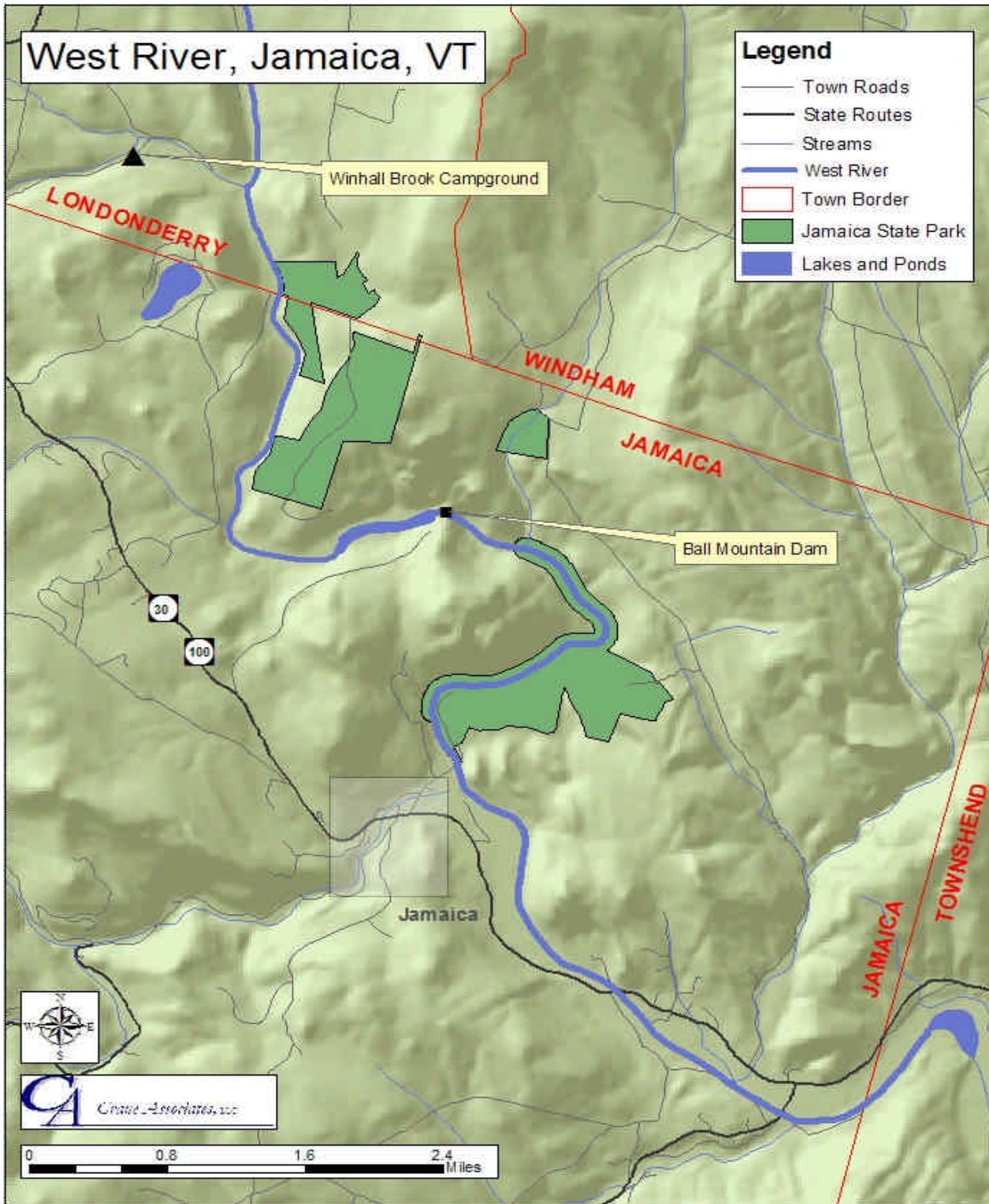
Executive Summary

This study is an economic impact analysis of the effects of boater visitation on the local economy of Jamaica Town and Windham and Bennington counties in Vermont as a result of the West River Release. The "Release" is a semi-annual event when the Army Corps of Engineers, through cooperation with state and federal agencies, open the gates of Ball Mountain Dam and releases enough water (750-1500 cfs) to create a quality whitewater experience. Boaters from eight neighboring states have come to the release for the past 50 years. The release originally provided 6 paddling days per year until 1990 when it was reduced to 4 days per year, twice in April and twice in September. In 2003, the release was reduced to 3 days per year, two days in April and one day in September. The study examines the economic contribution boaters make to the local economy and the economic loss resulting from the reduction of paddling days.

The primary data for this study was collected on Saturday, September 20th, 2003 during a 1-day release. A random sample of 134 boating parties (response rate 49%) provided expenditure data as well as opinions on a variety of management options for the river. The survey results have a 95% confidence level and an 8% margin of error (confidence interval). Boater population was estimated to be 2,193 for that day. A majority of boaters, over 40%, came from Massachusetts. Connecticut and New Hampshire followed with the next most popular states of origin; 11% of the boaters came from Vermont.

The largest expenses were in food (prepared and unprepared), transportation and entrance fees to Jamaica State Park, in that order. Approximately 75% of the expenditures for the trip were made within a 10-mile radius of Jamaica. Average per party spending was \$262. There were a total of 727 parties visiting the river on the sample day. Direct spending in the region amounts to \$190,798 for the one-day event. With an economic multiplier of .53, the total economic impacts to the region of the one-day release in September 2003 was \$292,092. In addition, there are 5 total jobs supported by the one-day release. A two-day release would contribute a total of \$440,065 to the economy and support 7.4 total jobs. The economic loss of reducing the release by one day is \$147,973 amounting to a 34% reduction in revenue to the local economy. The total economic loss to the local economy since the first reduction of paddling days in 1990 is 5.6 million dollars. This loss is sustained by the local economy indefinitely until the release is returned to the original schedule or the resource provides another benefit of equal or greater value. With no changes to the release, the local economy will lose over 7 million dollars over the next ten years. The financial benefit of returning to the traditional release schedule of 3 weekends is over \$1.3 million dollars per year or \$15.7 million over the next ten years.

Location Map



Introduction

The West River is a public resource that provides multiple benefits. Among the benefits includes: Recreation in the form of fishing, boating, hiking, swimming, picnicking and wildlife watching; Environmental Quality in the form of clean water, healthy aquatic habitat, and riparian ecology; Consumptive uses such as irrigation are also benefits derived from the river albeit with much less demand. The Ball Mountain Dam was constructed in 1961 to control flooding. It is currently managed to prevent property damage from flooding and to provide for multiple uses such as recreation and wildlife management (Army Corps of Engineers 2004¹).

Whitewater paddling on the West is a long-standing tradition. The Appalachian Mountain Club (AMC) organized boating trips on the West since 1955. During the construction of the dam negotiations were held and an agreement was reached between State Commissioner of Public Works, State Senator Janeway of Londonderry, Vermont, Brigadier General Seymour Potter of the ACOE and Roland Palmedo and Homer Dodge of the AMC to provide three scheduled weekend releases, two in the spring and one in the fall². The National Whitewater Slalom Championships were held on the West River in 1957 and 1958. Weekend paddling events were organized in April, May and September since the late 1950s until 1989. In 1990 one of the two springtime releases was eliminated. Since then, 2 two-day weekends per year were provided. In September 2003, the releases were reduced to one day per weekend in the fall and one or two days in April on the condition that there is enough water to meet the ramping schedule³ dictated by the river managing agencies. In total, the releases were reduced from 6 annual days between 1962 to 1989 to 2 annual days today (or possibly a third day in April if there is enough water in the reservoir).

This study is an economic analysis of the effects of the boater visitation on the local economy of Jamaica Town and Windham and Bennington counties. In rural areas such as Jamaica, Vermont, natural resources are typically the foundations of the economy. Unlike urban or suburban areas which largely rely on services and knowledge-based industries, rural areas rely on natural resource based jobs such as agriculture, forestry, and tourism. Resource management decisions made by relevant agencies, therefore, typically have greater impacts on rural economies than on urban and suburban economies. This study is an analysis of how the change in the number of release days affects the local economy.

The methodology used captures the “economic impacts” of the West River release. This study will not reveal the total economic value obtained from the West River release. Total economic value is measured by combining all the market values with the non-market values (Randall 1991⁴). Market values are measured by dollars received in the exchange for goods and services related to

whitewater recreation on the West River. The non-market values are measured by what people are willing to pay on top of what they already pay to enjoy the river. The difference between what people actually pay and what they are willing to pay is referred to in welfare economics theory as “consumer surplus”. Consumer surplus accrues to all members of the public whether they value environmental protection, whitewater recreation or both. Consumer surplus is recognized as the appropriate measure of non-market values (US Water Resource Council 1979, 1983; Dwyer 1977). Willingness to pay (WTP) is the metric used to measure consumer surplus. The scope of this study is limited to measuring only the market benefits of the West River release. When visitors pay very little to use natural resources for enjoyment (such as a \$2.50 park entrance fee) the consumer surplus is typically large because most visitors are willing to pay much more. Therefore the estimates of impacts herein are conservative.

Market benefits refer to the benefits associated with those activities that contribute to the economy. Economic benefits studies are divided into two types: economic significance analysis and economic impacts analysis (Stynes and Propst 1992⁵). Economic significance refers to the overall contribution of visitor spending generated by the resource including local resident spending. Impact analysis identifies the changes in economic activity resulting from a particular action. Impact analysis isolates the spending that would not otherwise have occurred in the region but for the actual implementation of a policy or management action (Chang et al 2003⁶). The West River release is a single event that generates a unique economic impact and thus this study is an impact analysis. The results will document the economic contribution the visitors to the West River release make to the local economy.

Economic impact (EI) is determined by measuring and multiplying together the following 4 factors: the number of visitors (V); the average spending per visit (S.ave/visit); the capture rate (CR); and the economic multiplier (EM)⁷.

$$EI = V \times S.\text{ave}/\text{visit} \times CR \times EM$$

Visitation is estimated through visitor counts at the front gate of the park, estimates conducted by the Corps of Engineers, commercial sales, shuttle trips sold, the number of private campsites sold to boaters, and other indicators. Spending profiles come from visitor surveys distributed during the whitewater release in September 2003. Capture rate is the proportion of visitor spending that is “captured” in the local economy and the multipliers refer to the amount of imported dollars that are circulated in the local economy before leaking out. The capture rate and multipliers are both derived from regional input-output models and cross-checked with other relevant studies. Input-output analysis enables analysts to estimate the direct and indirect economic activity stimulated in the region’s economy that is derived from employment activity, wage payments, and capital expenditures. The input-output model used for this study is IMPLAN

Professional 2.0 developed by the MIG group in Minnesota and first used by the US Forest Service. IMPLAN builds its data from top to bottom. National data serve as control totals for state data. In turn, state data serve as control totals for county data. The primary sources of employment and earnings data are the US Bureau of Labor and Statistics and the US Bureau of Economic Analysis. IMPLAN has been tested and compared to two other common I/O models (RIMS II and REMI) and is now widely recognized as an accurate and acceptable tool to measure direct, indirect and induced economic impacts⁸.

Visitation

The author interviewed Vermont State Parks staff and obtained all visitor data that is available on the dates of the West River release. Appendix 1 shows the visitation data that are on record at the Vermont Department of Parks and Recreation since 1991 for the dates of the release. Many of the dates do not have visitation records and some are unreliable. The data that were deemed reliable is included in Table 1.

Table 1: Entrance Fee Transactions. Jamaica State Park		
Date	Day Use	Campers
September, 1991	1069	n/a
September, 1991	904	n/a
April 25, 1991	709	n/a
April 26, 1991	357	n/a
September 25 1999	653	307
September 26, 1999	1702	298
April 29, 2000	646	320
April 30, 2000	307	312
September 30, 2000	902	304
October 1, 2000	1067	315
September 22, 2001	565	176
September 23 2001	196	173
April 26 and 27, 2003	594	771
Sept 20, and 21, 2003	954	730
April 24, 2004	852	364
April 25, 2004	191	309
September 25, 2004	1119	279
September 26, 2004	183	204
Total	12970	4862
Average	811	405

On average, Jamaica State Park sells approximately 811 day passes and allows another 405 visitors to camp. These numbers help start a baseline, or lower bound, of a boater population estimate. The number of people entering the Park and the number of boaters are not synonymous, although during these weekends, especially during the April event, it is a very strong majority. Personal observation was used on September 2003 to estimate the number of non-boating parties in the Park. During that weekend, a non-boating party used one campsite, or 2% of the total sites available. For day users, spectators were counted along the trail that runs parallel to the river at different hours of the day. Approximately 80 spectators were counted which equates to approximately 10% of the day use passes sold. Therefore, the lower bound estimate for boater population on

the West River is calculated by taking the average of the most reliable data from the past 13 years (18 event days) and reducing the day use by 10% and reducing the camping use by 2%: $811(.9) + 405 (.98) = 1126$ boaters.

However, this lower bound number must be augmented by three additional factors: 1) that many people that access the river by running their own shuttle outside of the park and accessing the river by walking up and over the impoundment; 2) by including the boaters who use only the lower and more novice, class-2 section of the river below the Park and 3) by adding commercial trips.

Winhall Brook Campground Attendance			
Date	Visitors	Sites	visitors/site
April, 2002	163	40	4.1
April, 2003	83	19	4.4
April, 2004	34	15	2.3

Table 2: Campground Attendance at Winhall Brook

Many boaters drive to the Ball Mountain Dam parking lot and walk over the impoundment to access the beginning of the whitewater run. In fact, in the spring this is the only way to access the whitewater section of the river since there is no shuttle service through the park due

to the muddy roads. Likewise, all of the guided rafting trips access the river this way in the Spring *and* Fall releases. Walking boats over the dam is a common and accepted practice among boaters.

Two companies now operate guided rafting services during the West River



Figure 1: Ball Mountain Dam Parking Lot and Impoundment

Release, Zoar Outdoor and Crabapple Whitewater. Both companies are based in western Massachusetts. The number of customers these two companies take down the river is shown in Table 3. All of these boaters access the river via the dam. Prior to the one-day release issued in September 2003, commercial outfitters brought, on average, 534 customers down the river. After the one-day release, there were an average of 393 commercial customers accessing the river, or a 27% annual decrease. When

calculating only the September dates the decrease was 35%. To determine economic impacts of the river release we use the pre-September 2003 average and use the post September 2003 average to determine the economic loss to commercial companies. Therefore 534 people are added to the lower bound estimate of 1126 for 1660 boaters. Two additional groups must be considered to determine an estimated boating population, the private boater who does not access the river through the park (the “upper section boaters”) and the boater who uses only the lower section of the river downstream of the Park. Both of these segments of the boater population are difficult to estimate but experience

Date	Zoar Outdoor	Crabapple	Total
April, 2004	101	422	523
Sept, 2004	110	161	271
April, 2003	116	373	489
Sept, 2003	125	164	289
April, 2002	73	494	567
Sept, 2002	232	249	481
April, 2001	118	433	551
Sept, 2001	148	227	375
April, 2000	205	489	694
= 1 day release			

and observation tells us that they exist in considerable numbers and should be counted.

Lodging accommodations help indicate the number of boaters accessing the river. Boaters attending the release are primarily campers. While some may stay in motels there are relatively few in the area so the number is small. Interviews with campground owners took place in January 2005 to

determine the number of boaters who camp at their establishments. The distance from their establishment to the river shows the extent to which boaters are willing to travel from their lodging location to the river on the day of the release. Table 4 shows the campgrounds in the areas and the distance to the park.

Campground	Town	Contact	Distance	Total sites	% used by boaters	# of sites used by boaters	# of boaters
Camperoma	Townshend	365-9725	9 miles	209	14%	29	117
Brattelboro North KOA	Dummerston	254-5908	18 miles	49	0	0	0
Bald Mountain	Townshend	365-7510	9 miles	200	33%	66	264
Hidden Acres	Dummerston	254-2098	18 miles	40	0	0	0
Kenoile Village CG	Newfane	365-7671	13 miles	150	2%	3	12
Winhall Brook	South Londonderry	802-847-4881	8 miles	111	25%	28	111
Total							504

The campground owners interviewed estimated the number of boaters who stayed at their campgrounds for the purposes of attending the West River release. Knowing whether the customer is a boater is relatively easy since nearly everyone attending the release brings boats strapped to their car and campground owners typically observe the owners vehicle as part of the check in process. Also owners are knowledgeable of the event since it is a 40-year tradition. There may be some campers who are intending to rent boats or who are going on a guided commercial trips and do not bring boats with them. Therefore, estimates from campground owners are likely to be conservative numbers.

What is evident from the data is the distances overnight guests are willing to travel to access the river. Boaters clearly prefer to camp as close to the river as possible. The propensity to stay at a lodging establishment farther than 10 miles from the river drops off significantly. There are very few lodging beds within the

10-mile radius that compete with campgrounds. Local bed and breakfasts do not draw many boaters due to the preferences of boaters nor are there many beds if they did. The high demand on Jamaica State Park campsites and the author's professional experience of the boating market indicate that the preferable choice of lodging for boaters is camping. If the West received an increase of boaters, local campgrounds (Winhall Brook, Camperama, and Bald Mountain) would be their first choice to stay and there are vacancies to accommodate them.

The supply of lodging facilities for West River boaters is ample and it is reasonable to conclude that overnight visitors on non-commercial trips to the West River release can be counted by the occupancy of campsites. The 61 sites in Jamaica State Park are occupied by 98% of boaters. The next closest campgrounds, Camperama, Winhall Brook and Bald Mountain, are between 14%-33% occupied by boaters. A factor of 4 campers per site is used to determine total campers. This number was based on an on-site estimate taken in September 2003, however it is likely a conservative estimate since the Jamaica State Park records show an average of 6 people per campsite. This represents an additional 504 overnight visiting boaters who are camping outside of Jamaica State Park (Table 4). If all of them accessed the river via the Ball Mountain dam trail then we would simply add them to our base figure of 1660 boaters for a total of 2164 boaters. However this would likely result in double counting since some of these campers may access the river by paying a day pass to the park and using the shuttle service. Some of them must be removed to avoid double counting yet it is arguable how many. Survey data clearly show that 80% of the boaters are whitewater boaters and since the upper section provides the best whitewater experience on the river and boaters are accustomed to walking over the dam, this study assumes 2/3rds of these campers are accessing the river through the upper section. Therefore it is assumed that 333 boaters are already counted in the Park's day pass figure and 333 are added to the base line of 1660 for a total of 1993 boaters.

The final additional source of boaters who must also be considered are those who float only the novice section. The section starts below the park entrance and can be accessed in many locations including a large field across from the Jamaica schoolhouse 200 yards from the park entrance. This is where many school groups, leagues, and clubs such as boy scouts go and learn paddling techniques for the first time. Many individuals without whitewater skills also access this section of river and float in makeshift rafts, tubes, kayaks, and canoes. While it is difficult to estimate these boaters, observation shows that a considerable number of people are taking advantage of the release outside of the park and it merits an estimate.

Kroka Expeditions, based in Newfane, VT, hosts their Community Paddling Day during the West River Release. This is a fund raising event for the organization and they report bringing 80 people down the lower section of the river. Marlboro

College Outdoor Program is known to use this section as well. Townshend Outdoors is a local business that caters to boaters on the lower section. The owner of that business reports that many people visit her shop as a result of the release. In fact she reports that the release weekend is her “best days of the year” for her business. She has witnessed many paddling clubs who use the lower section for training and instruction and is knowledgeable of many local residents who invite guests for the weekend because of the release. A Brattleboro based canoe rental business runs shuttles for the lower section. The Army Corps of Engineers owns property on the west side of the river at the Rt. 100 Bridge. Approximately 20 “unofficial” campsites are located there and are commonly filled each year. It is difficult to establish a number of boaters on the lower section but between the Kroka Expeditions fund raiser and the canoe shuttle business it is reasonable to assume that at least 100 people use the lower section. To determine an upper bound, considering the numerous clubs, local residents and the noticeable spike in local business revenues, it may be reasonable to assume at least 300 as an upper bound. For the purposes of this study we use the median figure of 200. This results in a total boater population estimate of 2193 (Table 5).

Jamaica SP	Commercial	Upper Section Private Boaters	Lower Section Private Boaters	Total
1126	534	333	200	2193

Economic Impacts

This analysis measures Total Industrial Output (TIO) or the market value of all goods and services produced as a result of the activity. Total income of employees’ wages and returns to proprietors are measured. Value added inputs to the economy are measured by the net increase in value from the purchases made by businesses and the value of the goods and services sold. Employment measures the number of full and part-time jobs in the economy. For each of these outputs there are direct, indirect and induced impacts. Direct impacts are measured by what goods and services are purchased as a result of the West River release. The indirect effects are measured by the goods and services bought by suppliers so that their businesses can sell to the visitors. Induced effects are measured by additional household spending that would not have otherwise occurred but for the West River release.

It is commonly accepted that recreation is an export industry (English and Bergstrom1994; Kriesel et al 1996)⁹. In other words, dollars are imported to the local economy from non-residents. The question arises during economic impact studies whether or not to include income from local residents. Johnson and Moore (1993) suggest that if local residents would still spend their money in the

region in the absence of the recreation resource being available then one does not include their expenditures¹⁰. If the resource alone induced spending by local residents that would have otherwise been saved then it should be included. The West River release is often the only opportunity for local residents to experience whitewater in Jamaica State Park. Local school groups and Clubs hire outfitters to bring them down the river and do not have a reasonable opportunity to go elsewhere at a similar cost on that weekend. Therefore, local spending is included in the impact analysis. In the case of West River the point is nearly moot since our survey sample showed only 10% of the boaters came from Vermont.

It is reasonable to assume a strong correlation between the economic impact and the West River release. While at some river releases visitors may visit the river as part of a longer and multi-purpose trip however such is not the case in Jamaica. The release occurs on the shoulder seasons of tourism. April is a very slow tourist season since the ski season is over and summer has not yet begun. It is generally too cold, muddy and wet to go hiking and biking. Many of the lodging businesses are closed. In September, summer vacation is over, school has begun, and fall foliage season has not yet peaked, although fall tourism has begun. Conversations with many of the business owners confirm that the weekend of the West River release is populated by a clear majority of boaters. Anecdotally, many Jamaica businesses comment that the West River Release is their best income generator of the year.

Data Collection

Expenditure data were collected from boaters visiting the river on September 20th and 21st 2003. A 21-question paper questionnaire was randomly distributed to boaters as they entered the Park. They were allowed to fill out the questionnaire at their leisure within the weekend and deposit it at the ranger station. There were 275 questionnaires distributed and 134 were returned completed for a response rate of 48.7%. The survey results have a 95% confidence level and an 8% a margin of error (confidence interval). The response rate was above average for similar river recreation studies (e.g.: Bergstrom et al 1990, 22%-44%; Cordell et al., 1990 32%; Loomis and King 1994 35%., Stoll et al 1988 30% Gomez and Ozuna, 1993 36.5%)¹¹.

Survey questions ranged from the type of paddling, to river management issues, expenditure patterns, willingness to pay for certain services during the visit and demographic data (see appendix 2).

Visitor Characteristics

A vast majority of boaters who paddle the West River are strictly whitewater boaters. When asked whether they primarily paddle whitewater, flatwater or both, 80% responded to whitewater versus, 19% who paddle both. When asked how often they paddle per year the answers ranged from 1 to 106. Boaters to

the West River take an average of 37 paddling trips per year. However, on average only 6.5% of them are taken in Vermont. This indicates that the West River is a highly important resource in Vermont and ranks as one of the few rivers that draw out-of-state boaters to Vermont.

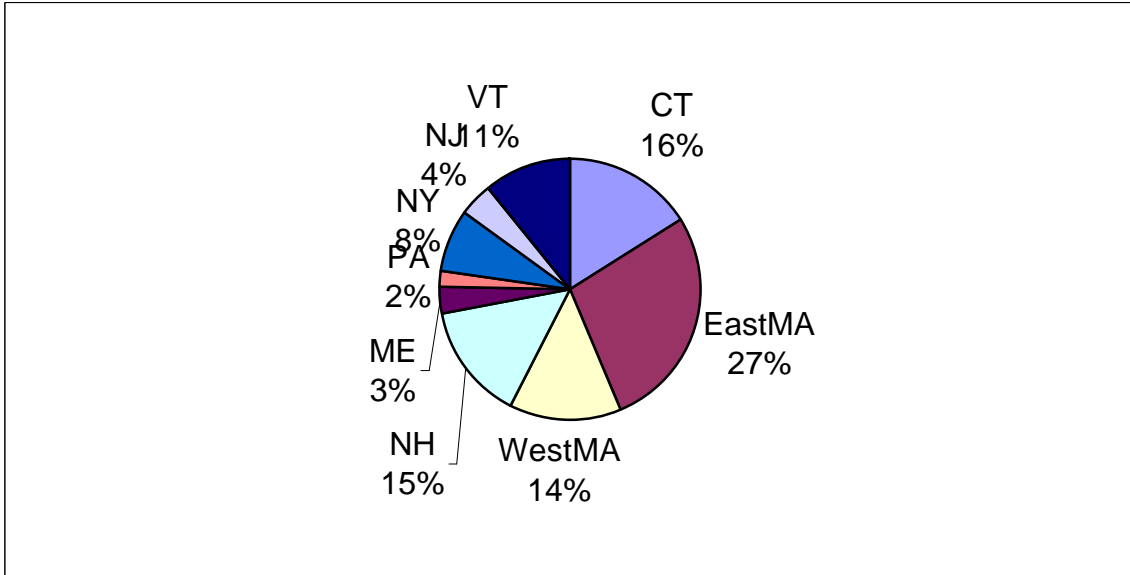


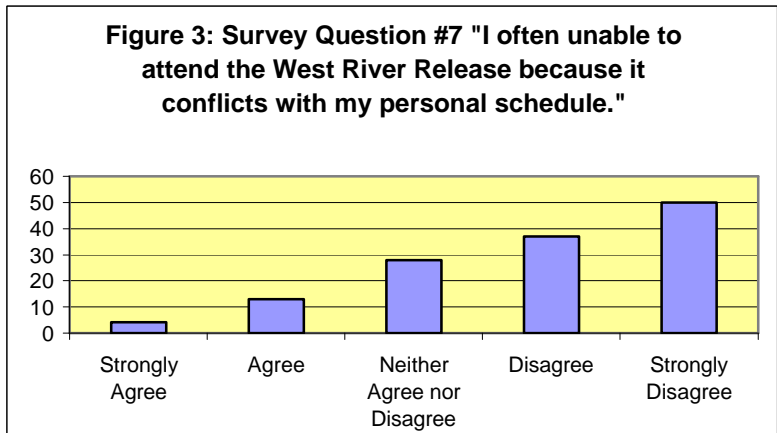
Figure 2 : Boaters Point of Origin

Figure 2 shows the location from where visitors came from to paddle the West River. Over 40% of the boaters came from Massachusetts, 2/3rds from the Boston area and other 1/3 from the western part of the state. Connecticut and New Hampshire follow with the next most popular states of origins. Only 11% of the boaters came the Vermont. After reviewing the data further, none of the sampled boaters came from within the local economy, a 10-mile radius of the Park. Likely there are some local boaters but the survey data suggest the number is negligible. The West River release creates a clearly discernable importation of dollars to the region. When determining the impacts on the local economy 100% of the visitor expenditures are used to determine impact. When determining the economic impact on the State economy, 89% of the expenditures are used.

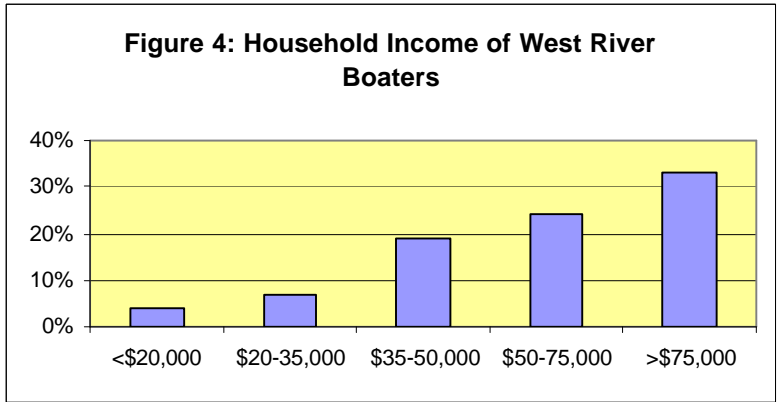
West River boaters are highly loyal as well. When asked if they often cancel the trip due to the river release conflicting with their personal schedules only 12% agreed with the statement while over 60% disagreed or strongly disagreed.

On average, the boaters who paddled the West River in September 2003 paddled the West River release 8.5 times in the past 10 years. Considering that the release occurs during the annual hydrologic cycle when many other rivers are also flowing, thereby giving boaters other river options, it is remarkable to note that most boaters have consistently returned to the West 85.5% of the time. This

is what marketing professionals refer to as “brand loyalty.” Jamaica Vermont and the businesses that survive on tourism can rely on a steady stream of income due in part to the loyalty of the “West River Release” brand. Moreover, this stream of income enters the economy at precisely the time when the local tourism businesses are weakest, between summer and winter, otherwise known as the “shoulder season”.



The demographic results of the survey show that West River boaters are typically educated, upper middle class males. The median age of the boaters is 40.5 years. Boaters are predominately male (63%) with a bachelors degree earning over \$75,000 per year.



Expenditures

The survey asked boaters to estimate the amount of money they spent on the trip to the West River release. A range of expenditure categories was included to help them remember where they spent their money. It also allows better tracking of the dollars. There were 11 categories plus an “other” category to allow respondents to write in items that were not listed. An “accommodations” category was accidentally removed from the list during survey reproduction. Many respondents included camping fees in the category of “entrance fee”. Other respondents wrote in motel or housing or lodging in the other category and inserted the amount spent. Respondents were asked to list expenses occurred



within a 10 mile radius of the Park and outside a 10-miles radius but within the State of Vermont. Respondents' expenditures are shown in Table 6.

Table 6: Expenditures for West River Trip		Farther than 10 Miles from Jamaica but in Vermont	Total
Expense	Within 10 miles of Jamaica		
Transportation	\$ 3,762	\$ 2,506	\$ 6268
Food	\$ 3,757	\$ 1,121	\$ 4878
Restaurant	\$ 5,278	\$ 1,990	\$ 7268
Non Alcoholic	\$ 784	\$ 265	\$ 1049
Alcoholic Drinks	\$ 2,124	\$ 474	\$ 2598
VT Farm Goods	\$ 707	\$ 256	\$ 963
Entrance Fee	\$ 3,315	\$ 184	\$ 3499
Souvenir Purchases	\$ 565	\$ 45	\$ 610
Local Arts & Crafts	\$ 962	\$ 10	\$ 972
Recreation Equip Rental	\$ 2,935	\$ 100	\$ 3035
Fishing Gear	\$ 200	\$ -	\$ 200
Other	\$ 2,018	\$ 1,810	\$ 3828
Total	\$ 26,407	\$ 8,761	\$ 35168

This expenditure data show that 75% of the expenses associated with the West River were made within 10 miles of Jamaica. The largest categories were in food (prepared and unprepared), transportation and entrance fees to Jamaica State Park in that order.

Impact Analysis

The sample of 134 respondents shows a total spending of \$35,168. The survey collected expenditures by the group size. A group is defined by the number of people in the traveling party. Boaters to a river typically travel with at least two vehicles so that a shuttle can be accomplished. Many vehicles cannot carry more than two or three boats and considering the extensive amount of gear that must fit in the vehicle a traveling party is typically two to three people. Four people occupy an average campsite and it is not unreasonable to see two cars per campsite for a river trip. The impact analysis assumes an average party size of 3 people or total 727 parties. There were 134 parties in the sample therefore the sample is 18% of the population. Average spending per party is \$262.

Jamaica Vermont lies on the border of two counties. Therefore the IMPLAN I/O model analyzes the impacts on the Bennington and Windham county regions. The model cannot distinguish between the county economy and a 10-mile radius around Jamaica Town. Direct spending, or the value of all goods and services sold in the region amounts to \$190,798 for the one-day event. IMPLAN assigns an economic multiplier or .53 for this event. This results in indirect impacts of

\$43,119 and induced impacts amount to \$58,175. Total economic impact to the region of the one-day release in September 2003 is \$292,092. In addition, there are 5 total jobs supported by this one-day release.

Economic Loss

The data and analysis examine the economic impacts of a one-day release. The study is also intended to provide information on the economic loss of moving from a two-day release to a one-day release. Loss estimates are performed by assuming what the purchases would have been for a two-day release based on the survey data. Simply doubling the expenses and running the I/O model would be inaccurate because not all expenses need to be doubled to extend the trip. For example gasoline purchases would be nearly identical if the visitor came for one day versus two days. Perhaps slightly more is used for extra shuttle trips or errands but the majority of travel is already paid for and an economy of scale for fuel is enjoyed. On the other hand, there is no economy of scale for restaurant purchases.

Table 7 shows the assumed additional expenses paid by boaters who would choose to spend two days at the river. Only restaurant and entrance fees are actually doubled. Souvenir purchases and other durable goods are assumed to not increase at all. Other items are assumed to increase by a certain

Table 7: Assumed Expenditure increases for 2-day release	Within 10 miles of Jamaica	Farther than 10 Miles. In Vermont	Total	add factor	2 day event
Transportation	\$ 3,762	\$ 2,506	\$ 6,268	10%	6,894.80
Food	\$ 3,757	\$ 1,121	\$ 4,878	35%	6,585.30
Restaurant	\$ 5,278	\$ 1,990	\$ 7,268	100%	\$ 14,536
Non-Alcoholic	\$ 784	\$ 265	\$ 1,049	50%	1,573.50
Alcoholic Drinks	\$ 2,124	\$ 474	\$ 2,598	50%	3,897.0
VT Farm Goods	\$ 707	\$ 256	\$ 963	0%	\$ 963
Entrance Fee	\$ 3,315	\$ 184	\$ 3,499	100%	\$ 6,998
Souvenir Purchases	\$ 565	\$ 45	\$ 610	0%	\$ 610
Local Arts & Crafts	\$ 962	\$ 10	\$ 972	0%	\$ 972
Recreation Equip Rental	\$ 2,935	\$ 100	\$ 3,035	10%	3,338.50
Fishing Gear	\$ 200	\$ -	\$ 200	0%	\$ 200
Other	\$ 2,018	\$ 1,810	\$ 3,828	50%	5,742.0
Total	\$ 26,407	\$ 8,761	\$ 35,168		52,310.10

percentage. On average, total purchases are assumed to increase by 67%. All other assumptions regarding party size, number of visitors and inputs to the model remain constant. This results in a conservative estimate because anecdotal evidence suggests that more people attend the release when there are two days of releases. For some boaters, the drive too long for one day of paddling.

Direct spending for all goods and services at a 2-day release results in \$283,801. Indirect and induced are \$66,262 and \$90,002 respectively. The total economic impact to the two-county regional economy is \$440,065 for a two-day event. The economic loss is the difference between the one and two day releases or \$147,973 amounting to a 34% reduction in revenue to the economy. This amount corresponds well with the reduction in the number of commercial customers taking trips. Commercial outfitters have reported a 35% loss in customers during the September 2003 and 2004 releases when the release was only one day. Commercial customer loss is independent empirical data that supports the assumption that the reduction to a one-day release negatively impacts the economy by approximately 34%.

Table 8: Economic Impacts Summary					
	Direct	Indirect	Induced	Total	Jobs
One Day Release	\$ 190,798	\$ 43,119	\$ 58,175	\$ 292,092	5
Two Day Release	\$ 283,801	\$ 66,262	\$ 90,002	\$ 440,065	7.4
Economic Loss	\$ 93,003	\$ 23,143	\$ 31,827	\$ 147,973	2.4

The total economic loss is calculated from the reduction of the original release schedule to the current release schedule. The original release schedule was one 2-day weekend in April, one 2-day weekend in May, and one 2-day weekend in the September. The economic loss of reducing the annual release schedule from 3 weekends to 1.5 weekends is calculated by adding the loss of one day plus the loss of one weekend. The annual loss of reducing the release from 3 weekends to 1.5 weekends is $\$144,973 + \$440,065 = \$585,038/\text{year}$. The community experiences this loss each year into the future until either the release is returned to its original schedule or until the community can capture an equal or greater benefit from the same resource – the West River. Since whitewater boating is a growing industry, the losses are likely to get larger as we move into the future.

The release was reduced from 3 weekends to 2 weekends per year between 1990 and 2002. In 2003, the river managers reduced the release further to 1.5 weekends per year. Therefore since 1990, the local economy experienced a loss of \$440,065 per year for 12 years and \$585,038 for the last 2 years. Adjusting for inflation the total economic loss to the local economy since 1990 is $(\$440,065 \times 12) + (\$585,038 \times 2) = \$5,617,662$. This loss will continue into the future.

If all variables remained constant, such as the expected number of boaters and their expenditures, the economic loss each year is \$585,038. If the release schedule did not change for the next ten years, 2005 to 2014, the inflation adjusted losses to the local economy would equal \$7,304,711. This estimated loss is likely a conservative number since whitewater kayaking is a rapidly growing industry and it is reasonable to assume there would be more boaters in

the future than there are today. Kayaking among young people 16-24 years old grew by 60% between 2000 and 2002¹².

A return to the traditional release schedule of three 2-day weekends per year would generate the benefits of a two-day release multiplied by 3. The benefits of a 3-weekend scenario are multiplicative because each weekend would be a unique trip for the boating party. Therefore, the annual financial benefit of returning to the traditional release schedule of 3 weekends per year is \$440,065 x 3 or \$1,320,195. Adjusting for inflation, the financial benefit to the local economy over the next ten years totals \$15,732,566.

Opportunity Costs

If at anytime the amount of water in the river is adequate to provide whitewater boating and there are no (or very few) boaters to use the resource then the local economy experiences an opportunity cost. Strictly defined, the opportunity cost of an action is the value of the foregone alternative action. The cost associated with the action of releasing water from the dam without a public recreational benefit equals the amount that could have been captured by the local economy if the boaters had been notified so they can access the whitewater. United States Geological Survey (USGS) gage data records the amount of water in the West River at Jamaica. Any amount of water above 750 cubic feet per second (cfs) provides a white water experience. In 2003, USGS data shows that there were 22 days in the spring (April and May) when there was more than 750 cfs in the river. In the fall of 2003 there were 24 days with enough water in the river for whitewater recreation. In the spring of 2004, there were 20 days and in the fall of 2004 there were 9 days. In total, for the last two years, there were 75 days when there was enough water in the West River at Jamaica to provide whitewater recreation. However there were only 3 days per year when the release was scheduled and announced to the public. Only during those 3 days did the local economy capture the financial benefits of river recreation. The remaining 69 paddling days that flowed down the river without the local economy or the public benefiting represents the opportunity cost. The value of the 69 lost paddling days equals the amount that was not spent in the local economy. If all paddling day expenditures were equal, the cost would be as high as the loss experienced from a one-day event (\$147,973) multiplied by 69 or \$10.2 million. Since some of the paddling days would be mid-week the number of boaters and their expenses would be less than the estimates in this study. On the other hand, a single lost weekend amounts to \$440,065 in opportunity cost. Therefore, with 69 lost paddling days in the past two years it would be reasonable to assume that the opportunity cost is several million dollars per year.

Appendices

Appendix 1

Attendance Records For Jamacia State Park		
Date	# of Daytime	# of Campers
September, 1991	1069	no records
September, 1991	904	no records
April 25, 1992	709	no records
April 26, 1992	357	no records
April 23, 1994	no records	no records
April 24, 1994	no records	no records
September 24, 1994	no records	no records
September 25, 1994	no records	no records
April 29, 1995	no records	no records
April 30, 1995	no records	no records
September 21, 1995	no records	no records
September 22, 1995	no records	no records
April 28, 1996	no records	no records
April 29, 1996	no records	no records
September 21, 1996	525	no records
September 22, 1996	456	no records
April 26, 1997	no records	no records
April 27, 1997	no records	no records
September 27, 1997	no records	no records
September 28, 1997	no records	no records
April 25, 1998	no records	no records
April 26, 1998	no records	no records
September 26, 1998	no records	no records
September 27, 1998	no records	no records
April 24, 1999	no records	no records
April 25, 1999	no records	no records
September 25, 1999	653	307
September 26, 1999	1702	298
April 29, 2000	646	320
April 30, 2000	307	312
September 30, 2000	902	304
October 1, 2000	1067	315
April 28, 2001	no records	no records
April 29, 2001	no records	no records
September 22, 2001	565	176
September 23, 2001	196	173
April 27, 2002	no records	no records
April 28, 2002	no records	no records
September 19, 2002	no records	no records
September 20, 2002	no records	no records
April 26, 2003	Unreliable	Unreliable
April 27, 2003	Unreliable	Unreliable
September 20, 2003	Unreliable	Unreliable
September 21, 2003	Unreliable	Unreliable
April 24, 2004	852	246
April 25, 2004	191	209
September 25, 2004	1119	279
September 26, 2004	183	204

21 Questions on Paddling in Vermont



River Management and River Policy in Vermont

Please Return to the Ranger Station before Sunday
September 21st at 12:00 noon

Dear Paddler:

Improving the quality of your paddling experience depends on YOU. This questionnaire asks for your opinions and knowledge on specific West River Release management issues, your contribution to the local and state economy, and other boating policy issues.

Your answers to these 21 questions is extremely vital to the decisions being made on the management of Vermont's rivers. This questionnaire should take you only **10 minutes** to complete. The only way to acquire this information is through surveys such as this so taking a few minutes now to complete this would **help tremendously**.

When you are done please place it in the survey box located at the State Park's front gate.

Thank you and happy paddling!



- 1) Do you primarily paddle: (circle one)
 (1) whitewater (2) flatwater (3) both?
- 2) How often did you paddle this year? Include all non-motorized boat trips taken anywhere.
 Please write the number of trips here: _____
- 3) Of all the non-motorized boat trips you took this year how many were in Vermont?
 Please write the number of Vermont trips here: _____
- 4) Of all the Vermont non-motorized boat trips taken this year, in what percentage of them did you use a State of Vermont maintained access point (put-in or take-out) ?
 Please write approximate percent of trips with State of Vermont access point: ____%
- 5) The purpose of this question is to determine your contribution to the local and state economy as a result of you visiting the West River today. We would like to know how much money was spent by your group in traveling to and using the West River this weekend. It may be difficult to remember exactly what was spent by your whole group but please try to estimate as best you can. We would like to know your expenditures in two categories, local and state. Local expenditures are made within approximately 10 miles from Jamacia State Park. State level expenditures are made within Vermont but farther than 10 miles from Jamacia State Park. Please review the following categories and fill in the amount you estimate that your group spent on the following categories:

Cost Category	Expenses within 10 miles of Jamacia State Park	Expenses within Vermont but not within 10 miles of Jamacia State Park
A) Transportation (gas, oil, rental car, auto repairs)	\$	\$
B) Food Purchased in a store	\$	\$
C) Food Purchased in a restaurant	\$	\$
D) Non-alcoholic drinks	\$	\$
E) Alcoholic Drinks	\$	\$
F) Vermont farm goods (cheese, maple syrup	\$	\$
G) Entrance Fee	\$	\$
H) Souvenir purchases	\$	\$
I) Local Arts and Crafts	\$	\$
J) Recreation equipment rental(bikes, boats,	\$	\$
K) Fishing Gear and/or Bait	\$	\$
L) Other (please specify)	\$	\$

6) In the past ten years (1993 - 2003) how many times have you come to the West River Release (circle one).

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

7) Please check the box which most closely describes the degree to which you agree or disagree with the following statements:

	Strongly Agree	Agree	Neither agree nor Disagree	Disagree	Strongly Disagree
I am often unable to attend the West River Release because it conflicts with my personal schedule.					
I would attend the West River Release more often if it was held in the summer months (June, July or August)					
I would attend the West River Release more often if it was held 4 weekends per year, two in September and two in May					
I would be willing to pay a \$5 entrance fee (instead of the standard \$2.50) if the release occurred 4 weekends per year					
I would be willing to pay a \$10 entrance fee (instead of the standard \$2.50) if the release occurred 4 weekends per year					
I would be willing to pay a \$15 entrance fee (instead of the standard \$2.50) if the release occurred 4 weekends per year					
I would be willing to pay a \$20 entrance fee (instead of the standard \$2.50) if the release occurred 4 weekends per year					
I believe there are too many boats on the river during the Release week-end					
I believe there are too many boats on the river during the Release week-end but I do not want restrictions that would limit the number of paddlers on the river.					
I believe there are too many boats on the river during the Release week-end and I want to see restrictions that would limit the number of paddlers on the river even if it prevents me from accessing the river.					

8) Circle the response that best matches your feelings about the boat shuttle service during the West River Release. If the boat shuttle service were not available, I: (Circle One)

- 1) would definitely not paddle
- 2) may not paddle
- 3) am not sure whether I would paddle or not
- 4) would most likely paddle
- 5) would certainly paddle



9) How many trips down the river do you make during a one day period during the West River Release weekend (Circle One) 0 1 2 3 4 5 more than 5

10) Do you think the average boater at the Release would be willing to pay \$6 for one shuttle?
 YES NO

11) Do you think the average boater at the Release would be willing to pay \$7 for one shuttle?
 YES NO

12) Do you think the average boater at the Release would be willing to pay \$8 for one shuttle?
 YES NO

13) Do you think the average boater at the Release would be willing to pay \$15 for an all day shuttle pass?
 YES NO

14) We are interested in knowing how you think the West River Release impacts the fish and other aquatic life in the river. Please complete the following statement:

As a result of the West River Release the aquatic life in the river is (Circle one):

1) ADVERSELY IMPACTED 2) MINIMALLY IMPACTED 3) NOT IMPACTED 4) IMPROVED,

15) If the State of Vermont asked boaters to voluntarily register all of their non-motorized boats (canoes, kayaks, row boats etc) at a cost of \$5 per boat would you register? (Circle one)

1) YES 2) MOST LIKELY 3) PROBABLY NOT 4) NO

16) If the State of Vermont required boaters to register all of their non-motorized boats (canoes, kayaks, row boats etc) at a cost of \$5 per boat would you try to avoid complying with this requirement? (Circle one)

1) YES 2) MOST LIKELY 3) PROBABLY NOT 4) NO

For statistical reasons we would like to know a few things about your background.
Remember these and all your responses are strictly confidential and anonymous.

17) What is your zip code? _____ 18) What is your age ? _____

19) Are you :(circle one) Male OR Female

20) What is your highest level of education completed? (circle the number corresponding your highest grade completed)

9 10 11 12 13 14 15 16 17 18 19 20

21 Circle the response that most closely matches your annual household income

a) < \$20,000 b) \$20-\$35,000 c) \$35-\$50,000 d) \$50-75,000 e) >\$75,000

PLEASE RETURN THIS QUESTIONNAIRE TO THE PARK RANGER STATION.
THANK YOU VERY MUCH!!!!



Appendix 3: Inflation Adjusted Losses

Calendar year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Annual Loss in 2003 dollars	\$440,065	\$440,065	\$440,065	\$440,065	\$440,065	\$440,065	\$440,065	\$440,065	\$440,065	\$440,065	\$440,065	\$440,065	\$440,065
Estimated Losses in Year	\$335,752	\$347,925	\$357,944	\$366,210	\$373,919	\$381,947	\$390,160	\$396,746	\$400,304	\$406,944	\$417,078	\$425,820	\$431,876
PCE Deflator (1996=100)	80.497	83.416	85.818	87.800	89.648	91.572	93.542	95.121	95.974	97.566	99.995	102.091	103.543
PCE Deflator (2003=100)	76.296	79.062	81.339	83.217	84.969	86.793	88.660	90.156	90.965	92.474	94.776	96.763	98.139

March 2005 Economy.com Macro Solve

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	\$585,038	\$585,038	\$585,038	\$585,038	\$585,038	\$585,038	\$585,038	\$585,038	\$585,038	\$585,038	\$585,038	\$585,038
	\$585,038	\$597,823	\$610,982	\$625,317	\$639,337	\$651,572	\$663,681	\$675,798	\$689,229	\$702,928	\$716,899	\$731,147
1990-2003	\$ 5,617,662											
	105.506	107.812	110.185	112.770	115.299	117.505	119.689	121.874	124.296	126.767	129.286	131.856
	100.000	102.185	104.435	106.885	109.281	111.373	113.442	115.513	117.809	120.151	122.539	124.974
										2004-2014		\$7,304,711

means average of 2001-2010 ten year period



End Notes

- ¹ US Army Corps of Engineers. Update Report for Vermont. May 31st 2004. Concord MA
- ² Appalachian Mountain Club. Letter to Richard Carlson Army Corps of Engineers, 10/17/03
- ³ Ramping is referred to as the gradual increase and decrease of water into the river channel.
- ⁴ Randall, A . 1991. Total and non-use values. In: John Braden and Charles Kolstad (eds) *Measuring the Demand for Environmental Quality North Holland*. Elsevier, pp 303-323
- ⁵ Stynes, D.J. and Propst, D.B. 1992. "A system for estimating local economic impacts of recreation and tourism" *Measuring tourism impacts at the community level*. S. Relliing, ed Report #374, Maine Agriculture Experiment Station, University of Maine, Orono, ME
- ⁶ Chang, W-H; Propst, D. Stynes, D. Jackson, RS. 2003. Recreation Visitor Spending Profiles and Economic Benefit to Corps of Engineers Projects. Army Corps of Engineers ERDC/EL TR-03-21
- ⁷ ibid
- ⁸ Lynch, Tim. 2000. Analyzing the Economic impacts of Transportation Projects using RIMS II, IMPLAN and REMI. US Department of Transportation.
- ⁹ English, D and J.Bergstrom. 1994. The conceptual Links between Recreation Site Development and Regional Economic Impact. *Journal of Regional Science*. 34:599-611.
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- ¹¹ Bergstrom JC., HK Cordell, GA Ashley, AE Watson 1990. Economic Impacts of State Parks on State Economies in the South. *Southern Journal of Agricultural Economics*. 22:69-78.
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