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**April 10-12, 1994
Saratoga Springs, New York**



NORTHEASTERN RECREATION RESEARCH MEETING POLICY STATEMENT

The Northeastern Recreation Research meeting seeks to foster quality information exchange between recreation and travel resource managers and researchers throughout the Northeast. The forum provides opportunities for managers from different agencies and states, and from different governmental levels, to discuss current issues and problems in the field. Students and all those interested in continuing education in recreation and travel resource management are particularly welcome.



Melding Research and Management





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NOTE: These proceedings have been prepared using electronic and hard copy supplied by the authors. While some editing has been done, authors are responsible for the content and accuracy of their papers.

PROCEEDINGS of the 1994 NORTHEASTERN RECREATION RESEARCH SYMPOSIUM

April 10-12, 1994
State Parks Management and Research Institute
Saratoga Springs, New York



Compiled and Edited by:

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OUTDOOR RECREATION: SATISFACTION AND CONFLICTS

The Hidden Public: Subculture Differences in Attitudes and Satisfaction. Rodney Zwick, Lyndon State College; David Tucker, Northeast Kingdom Community Action; Susan Bulmer, Vermont Department of Forests, Parks and Recreation.

ENVIRONMENTAL PERCEPTIONS AND ETHICS

State Park Stewardship Survey--1993 State of the Parks Report. Allison McLean, Wilbur LaPage, New Hampshire Division of Parks and Recreation; Rob Robertson, University of New Hampshire.

PLANNING AND G.I.S.

Boating Opportunities: A Geographical Analysis of Travel Patterns and Motivations. John Confer, Jr., Alan Graefe, Pennsylvania State University; John Titre, U.S. Army Corps of Engineers, WES.

The Moosalamoo Partnership: Using GIS and CPS for Composite Trail Maps. David Capen, Daniel Coker, University of Vermont; Mary-Jeanne Packer, Green Mountain National Forest.

MEASURING AND IMPROVING CUSTOMER SATISFACTION WITH GOVERNMENT SERVICES

Glen D. Alexander

Chief, Ohio Department of Natural Resources, Division of Parks and Recreation, 1952 Belcher Dr. C-3 Columbus, OH 43224

Two years ago, Ohio State Parks developed a methodology of measuring customer satisfaction to gauge the effectiveness of our customer service. What follows is a discussion of our installation of systems to measure and improve customer satisfaction, the interpretation of the data, and the positive results we have enjoyed.

Measuring Customer Satisfaction

We elected to develop our own customer satisfaction survey form (see Figure 1 on following pages) to enable our customers to respond to us about how they enjoyed their visit to one of our Ohio State Parks. This form is pre-franked and is mailed directly to our Columbus headquarters. It contains both structured and unstructured response sections. The survey is run for the five summer months of May, June, July, August, and September when 80% of the visitation to Ohio State Parks occurs. Since it takes at least two employees to operate and imposes a strain on many other managers it is not cost effective to operate during the seven off season months.

In Columbus the structured response section is entered into our computer data base and means and standard deviations are calculated from this base for the Ohio State Park system as a whole and for each of the 72 individual parks.

We are most interested in the responses to the question: "How would you rate your visit to this park overall?". A five point scale is used for responses to all structured questions with excellent = 5 and unacceptable = 1. The customer returns are tabulated by park and means are calculated to 3 decimal places. The comparison in how these means fare from month to month is tracked by park and for the Ohio State park system as a whole. We have found a very high correlation with what is going on in a park and the trend of this mean. When it goes down we can usually identify the reasons why; and likewise when it goes up. Certainly small spot random variations do occur, however they easily are weeded out by trend line analysis. (The table of means calculated for 1992 and 1993 is attached in Table 1; see following pages.)

The balance of the structured portion of the questionnaire is used to spot problem areas in particular service categories and to make rough comparisons of service categories between parks.

The unstructured response areas of the questionnaire provide the park staff with ideas, examples, and data on how they improve customer satisfaction by resolving problems, instituting innovations, and capitalizing on particularly customer pleasing situations. In the unstructured portions of the customer survey forms we find many of our best ideas and innovations. We do read these in Columbus and do an anecdotal analysis of these returns over the winter period.

To provide a statistical validation of our in-house analysis of the customer survey returns, we have engaged The Ohio State University Polymetrics Laboratory to run a random telephone survey concurrently in the same time period each year that we are operating our own survey. They use exactly the same questionnaire form and gather some additional information as well. The results of the OSU surveys, randomly conducted with rigorously sound statistically protocols, have provided means that are not statistically different from our own means. The OSU means have an error factor of $\pm$4.4% for the 305 valid response sample they use. We feel quite confident that our "N's" which equal 9,800 returns in 1992 and 20,200 returns in 1993, are sufficiently high enough to give us statistically valid data as corroborated by the OSU surveys. (A comparison of OSU means and our own means is shown in Table 2.) Ohio State Parks experience 65,000,000 visitors annually who picked up about 600,000 surveys in 1993. The 20,200 received in Columbus represents a return of 3.5%, which is excellent by industry standards.

Improving Customer Satisfaction

We have established Total Quality Management (TQM) feedback loops with the employee teams in each of our parks as one of our methods of continuously making improvements in customer satisfaction. Copies of the surveys are returned to each park each week. The entire park staff sits down as a team and reviews the results of the surveys and especially the non-structured comments. Our central office also returns the means calculated for each park on a monthly basis with comparisons with the previous year, some indication of how the division is doing as a whole, and trends in how other parks are doing.

Each park staff team has been empowered to unilaterally make whatever changes are appropriate to improve customer satisfaction. The Ohio State Park system has 72 parks and some of those are large enough to have separate employee team meetings along functional lines. Golf course employees for example tend to meet by themselves and work on improving golf course customer satisfaction. With many, many teams operating, the results drive customer satisfaction far better than any possible effort from some central administration. Literally hundreds of changes in the way we do business are implemented each visitor season by the employees themselves.

Ideas implemented by these park teams have ranged from changing the hours of checking in and out of campsites and cabins to the acceptance of credit cards in the state system for the first time, and providing multiple picnic tables for groups staying together in cabins or campsites. We are overhauling the entire check-in procedure for cabins and campgrounds and eliminating all but one simple universal form statewide at employees' suggestion. This will speed up check-in time and greatly simplify check-in procedures which pleases our customers. One park built a small, inexpensive fish cleaning station. Another rehabilitated a shower building into a model of what a modern shower house should be like. Yet another changed its entire cleaning schedule to meet customer preferences.

Most importantly is the feedback received on cleanliness of facilities. This is the most commented upon service and the one we have been able to influence most significantly as a direct result of this feedback. The 1993 OSU survey found a statistically significant increase in customers' favorable perception of cleanliness in Ohio State Parks versus 1992's users. The OSU survey also indicated that a significant increase in favorable response to our campground employees was seen as well. Expansion of pet camping to all parks in the system, the systematic improvement of food service at restaurants, camper store services of firewood, ice, and other products, and greatly increased naturalist programs are additional examples of how this feedback is driving increased customer satisfaction in Ohio State Parks today.

Many parks post the customer survey results and significant returns on bulletin boards. The Chief of Parks writes a personal letter to any employee who gets a personal mention on the forms coming back in. We provide annual awards for the parks whose means achieve 4.500 or better. In 1992 ten parks made that rating. In 1993 seventeen parks made that rating. The plaque presented at the annual managers conference is large enough for the names of all the employees in that park to be engraved as recognition of the idea that customer satisfaction is a team effort that all employees

must participate in to be successful. The employees like the system, like the feedback which is over 80% positive, and like the freedom to make changes they see fit.

Positive Results We Have Enjoyed

Since its inception the customer survey means for the Ohio State Park system as a whole have increased each and every month over the previous month's means for ten straight months (5-month summer seasons each in 1992 and 1993). A graphic display of those means is shown in Figure 2. Whether one agrees with the "elegance" of our statistical approach or not, the indisputable fact remains that each month we have impressed more of our customers favorably, and fewer customers unfavorably, than the previous month. The actual numerical counts of complaints are down and the numerical counts of compliments are up.

Favorable mention of this program and focus upon pleasing our customers has begun to appear in the press. Legislators are also becoming aware of the "new look" in parks and are responding favorably to more satisfied constituents.

Our employees are responding favorably to this program in a variety of ways. As mentioned above they particularly like the positive feedback dimension from the people they serve. It simply means more to employees to receive feedback from their customers as opposed to their boss. They also like the recognition they receive in the form of letters, plaques, and peer awards. Our employees have adopted a "go out of your way to please our customers" attitude as a major positive result. This new attitude in our employees is gaining favorable comment from many quarters as the "new look" in Ohio State Parks.

Certainly not the least benefit from our increased customer satisfaction has come at the polls in November, 1993 in the form of a $200.0 million referendum passed to rebuild Ohio Parks infrastructure. Ohio State Parks was fortunate enough to be the point agency in the Ohio Parks and Natural Resources Fund bond issue authorization. This bond issue authorization had to pass the Ohio General Assembly by a 60% margin as a referendum and then be successful at the polls with all voters. The goal of this referendum is to rehabilitate, renovate, and modernize existing facilities in Ohio State Parks and other natural resource areas in Ohio. It included a dimension of matching grants for local park systems.

In our efforts to pass this referendum with state legislators first, and then in a grass roots effort with our park users and neighbors, we constantly came across the feedback that the parks had seen many changes for the better in customer service. People seemed to be responsive to our customer satisfaction emphasis and felt that if the referendum passed, its funds would likely be put to good use to take care of our customers. The referendum passed by a 61% to 39% margin which reflected in part the growing support for serving our customers right in Ohio's state parks.

As chief of the Ohio Department of Natural Resources, Division of Parks and Recreation, I strive to provide the best possible experience for all park visitors. Your comments can help me make our parks a better place for you to visit. Please take just a few minutes to fill out applicable sections of this evaluation form and drop it in the mail to me.

How would you rate your visit to this park overall? ☐ Excellent ☐ Good ☐ Average ☐ Poor ☐ Unacceptable

Specifically, how would you rate the following ...

	Excellent	Good	Average	Poor	Unacceptable	Comments:
General Park						
Appearance	☐	☐	☐	☐	☐	
Cleanliness	☐	☐	☐	☐	☐	
Convenience	☐	☐	☐	☐	☐	
Employee Helpfulness	☐	☐	☐	☐	☐	
Facilities Condition	☐	☐	☐	☐	☐	
Your Experience	☐	☐	☐	☐	☐	
Services You Received	☐	☐	☐	☐	☐	
Campground	Excellent	Good	Average	Poor	Unacceptable	
Cleanliness	☐	☐	☐	☐	☐	Comments:
Appearance	☐	☐	☐	☐	☐	
Employee Helpfulness	☐	☐	☐	☐	☐	
Facilities Condition	☐	☐	☐	☐	☐	
Cabin	Excellent	Good	Average	Poor	Unacceptable	
Cleanliness	☐	☐	☐	☐	☐	Comments:
Comfort	☐	☐	☐	☐	☐	
Facilities Condition	☐	☐	☐	☐	☐	
Lodge	Excellent	Good	Average	Poor	Unacceptable	
Activities	☐	☐	☐	☐	☐	Comments:
Facilities Condition	☐	☐	☐	☐	☐	
Cleanliness	☐	☐	☐	☐	☐	
Employee Helpfulness	☐	☐	☐	☐	☐	
Picnic Areas	Excellent	Good	Average	Poor	Unacceptable	
Cleanliness	☐	☐	☐	☐	☐	Comments:
Facilities Condition	☐	☐	☐	☐	☐	
Food Service	Excellent	Good	Average	Poor	Unacceptable	
Quality	☐	☐	☐	☐	☐	Comments:
Service	☐	☐	☐	☐	☐	
Beach	Excellent	Good	Average	Poor	Unacceptable	
Employee Helpfulness	☐	☐	☐	☐	☐	Comments:
Cleanliness	☐	☐	☐	☐	☐	
Facilities Conditon	☐	☐	☐	☐	☐	
Marina	Excellent	Good	Average	Poor	Unacceptable	
Cleanliness	☐	☐	☐	☐	☐	Comments:
Facilities Condition	☐	☐	☐	☐	☐	
Employee Helpfulness	☐	☐	☐	☐	☐	
Golf Course	Excellent	Good	Average	Poor	Unacceptable	
Course Condition	☐	☐	☐	☐	☐	Comments:
Employee Helpfulness	☐	☐	☐	☐	☐	
Cleanliness	☐	☐	☐	☐	☐	
Pro Shop Services	☐	☐	☐	☐	☐	

Name _____

Address _____

City _____ State _____ Zip _____

Date of Visit _____ Park Visited _____

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Figure 1. Customer satisfaction survey for Ohio State Parks.

Table 1. Summary of results of Ohio State Parks customer satisfaction survey for all parks.

OHIO DIVISION OF PARKS AND RECREATION
Customer Satisfaction Survey
SUMMARY OF ALL PARKS

As of 10/29/93

	1993	1992	% CHG
Total Surveys Returned:	20,213	9,832	105.6%

	AVERAGE RATING		PERCENT
	1993	1992	CHANGE
OVERALL Average:	4.358	4.283	1.8%
GENERAL PARK Average:	**4.321**	**4.268**	**1.2%**
Appearance:	4.471	4.445	0.6%
Cleanliness:	4.319	4.303	0.4%
Convenience:	4.237	4.229	0.2%
Employees:	4.473	4.412	1.4%
Facilities:	4.030	3.996	0.9%
Experience:	4.323	4.290	0.8%
Services Received:	4.370	4.301	1.6%
CAMPGROUND Average:	**4.318**	**4.244**	**1.7%**
Cleanliness:	4.385	4.336	1.1%
Appearance:	4.419	4.367	1.2%
Employees:	4.465	4.400	1.5%
Facilities:	4.017	3.905	2.9%
CABIN Average:	**4.140**	**4.093**	**1.1%**
Cleanliness:	4.214	4.195	0.5%
Comfort:	4.066	4.099	-0.8%
Facilities:	4.062	3.999	1.6%
LODGE Average:	**4.222**	**4.238**	**-0.4%**
Activities:	4.187	4.145	1.0%
Facilities:	4.225	4.262	-0.9%
Cleanliness:	4.246	4.271	-0.6%
Employees:	4.286	4.316	-0.7%
FOOD Average:	**3.941**	**3.800**	**3.7%**
Quality:	3.906	3.768	3.7%
Service:	3.986	3.842	3.7%
PICNIC Average:	**4.277**	**4.240**	**0.9%**
Cleanliness:	4.384	4.354	0.7%
Facilities:	4.157	4.129	0.7%
TRAIL Average:	**4.295**	**4.360**	**-1.5%**
Cleanliness:	4.346	4.467	-2.7%
Condition:	4.245	4.267	-0.5%
BEACH Average:	**3.950**	**3.941**	**0.2%**
Employees:	4.164	4.158	0.1%
Cleanliness:	3.938	3.944	-0.2%
Facilities:	3.850	3.861	-0.3%
MARINA Average:	**4.162**	**4.101**	**1.5%**
Cleanliness:	4.210	4.141	1.7%
Facilities:	4.063	4.000	1.6%
Employees:	4.255	4.252	0.1%
GOLF COURSE Average:	**4.413**	**4.324**	**2.1%**
Condition:	4.420	4.220	4.7%
Employees:	4.411	4.366	1.0%
Cleanliness:	4.510	4.473	0.8%
ProShop:	4.315	4.295	0.5%

Table 2. Comparison of Write Right" and Ohio State Customer Satisfaction Surveys summarizing results for all state parks.

OHIO DIVISION OF PARKS AND RECREATION
Comparison of "Write Right" and Ohio State Customer Satisfaction Surveys
Summary for All Parks
1993

Total Valid Responses:
"WRITE RIGHT..." 20,213
OHIO STATE 305

	Average		%	Number of Responses									
				5 Excel		4 Good		3 Avg		2 Poor		1 Unacc	
	"W/R"	OSU	DIFF	"W/R"	OSU	"W/R"	OSU	"W/R"	OSU	"W/R"	OSU	"W/R"	OSU
Overall Percent Distribution				49.7%	38.9%	39.8%	52.2%	8.0%	8.3%	1.6%	0.7%	0.9%	0.0%
OVERALL Average	4.358	4.292	1.5%	10,044	117	8,043	157	1,616	25	327	2	179	0
GENERAL PARK Average	4.321	4.174	3.5%										
Appearance	4.471	4.262	4.9%	10,372	112	6,940	159	1,114	27	173	3	43	0
Cleanliness	4.319	4.176	3.4%	8,799	105	7,004	153	1,853	35	395	7	119	1
Employees	4.473	4.239	5.5%	10,440	79	5,062	118	1,316	16	246	4	159	1
Facilities	4.030	4.017	0.3%	6,246	71	7,245	170	2,760	41	928	11	368	1
Services Received	4.370	4.195	4.2%	8,258	75	5,971	140	1,416	25	222	0	155	1
CAMPGROUND Average	4.316	4.270	1.1%										
Cleanliness	4.385	4.323	1.4%	5,991	39	4,318	49	904	8	201	0	86	0
Appearance	4.419	4.320	2.3%	5,946	39	4,262	50	780	8	153	0	55	0
Employees	4.465	4.299	3.9%	6,331	35	3,225	46	747	4	164	1	113	1
Facilities	4.017	4.138	−2.9%	3,890	22	4,381	64	1,551	7	642	1	290	0
CABIN Average	4.140	4.420	−6.3%										
Cleanliness	4.214	4.520	−6.8%	903	15	713	8	233	2	76	0	33	0
Facilities	4.062	4.320	−6.0%	683	10	781	13	302	2	90	0	28	0
LODGE Average	4.222	4.201	0.5%										
Activities	4.187	4.075	2.7%	710	16	707	26	215	10	62	1	17	0
Facilities	4.225	4.169	1.3%	922	22	772	33	222	9	80	1	28	0
Cleanliness	4.246	4.246	−0.0%	987	24	753	34	210	6	92	1	28	0
Employees	4.286	4.295	−0.2%	1,043	23	673	35	196	2	71	0	42	1
FOOD Average	3.939	3.870	1.8%										
Quality	3.904	3.793	2.9%	1,167	20	1,403	58	781	25	217	6	102	2
Service	3.983	3.946	0.9%	1,293	23	1,311	68	642	15	199	4	104	2
PICNIC Average	4.277	4.158	2.9%										
Cleanliness	4.384	4.210	4.1%	5,861	66	4,415	124	947	18	174	2	55	0
Facilities	4.157	4.106	1.2%	4,334	49	4,223	132	1,320	25	414	1	180	0
TRAIL Average	4.292	4.291	0.0%										
Cleanliness	4.343	4.374	−0.7%	3,667	68	2,851	88	672	7	165	0	42	0
Condition	4.243	4.207	0.8%	2,979	51	2,934	98	789	13	188	2	44	0
BEACH Average	3.950	3.710	6.5%										
Employees	4.164	3.789	9.9%	2,882	20	2,818	59	966	28	225	5	106	2
Cleanliness	3.938	3.707	6.2%	2,787	24	3,257	81	1,386	36	582	14	249	2
Facilities	3.850	3.654	5.4%	2,315	18	2,963	84	1,551	38	582	14	250	2
MARINA Average	4.159	4.079	2.0%										
Cleanliness	4.208	4.014	4.8%	1,916	11	1,938	51	560	4	101	3	67	0
Facilities	4.060	4.090	−0.7%	1,609	15	1,814	44	619	7	209	1	103	0
Employees	4.255	4.151	2.5%	1,903	14	1,478	34	478	4	89	1	74	0
GOLF COURSE Average	4.413	3.740	18.0%										
Condition	4.420	4.158	6.3%	810	5	689	12	64	2	23	0	10	0
Employees	4.411	4.053	8.8%	820	3	596	14	106	2	18	0	13	0
Cleanliness	4.510	4.368	3.2%	910	8	553	10	80	1	10	0	5	0
ProShop	4.315	2.125	103.1%	684	0	638	1	148	2	13	11	13	2

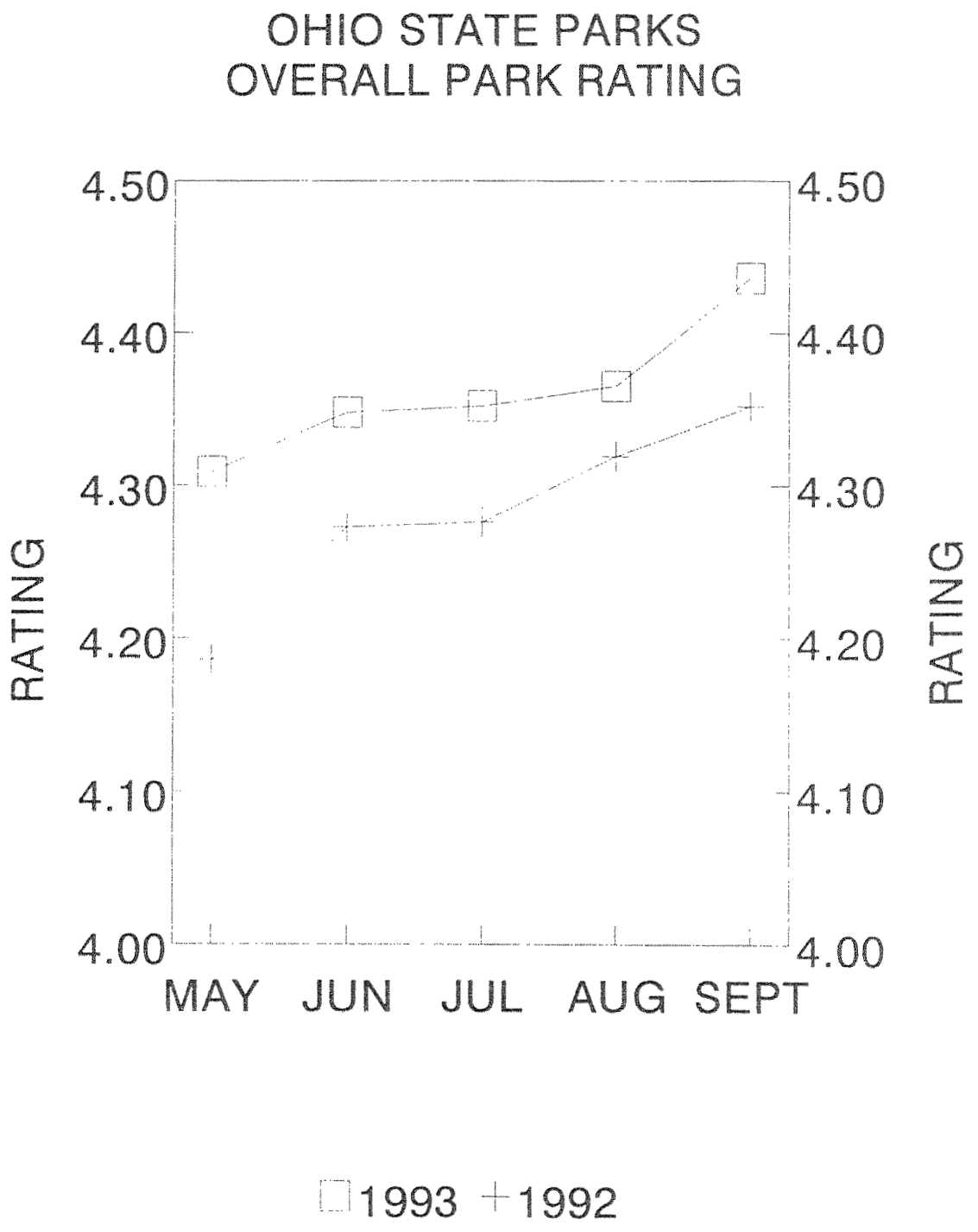


Figure 2. Graphic display of overall park rating for Ohio State Parks for 1992 and 1993.

THE RESOURCE AND THE STORYLINE:

AN INTERPRETIVE BALANCING ACT*

Wilbur K. LaPage

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The long era of "protection of natural resources through acquisition" is gradually drawing to a close. The budget-busting era of "protection through management" is forcing us to look for new funding mechanisms. But the idea of facilitating protection through enlightened self- interest is ripe for growth. Resource interpreters can provide the link with visitors and other constituents to influence "resource protective" behavior and develop a land ethic.

Trails without signs! Parks with unexplained origins! A battle field without battle plans or casualty lists! A poet's home without poetry! Whose failures are these? The most beautiful theater in the world doesn't merit more than one visit if it has no stage program. In fact, that theater would never be built without the guidance of producers, directors, set designers, lighting specialists, and dozens of other "interpreters". But, when was the last time you were asked to participate in the development and design of a park, trail, beach, wildlife refuge or historic area? Have you ever suggested that the park's "storyline" might be enhanced by park design; or that park interpretation might be compromised by the wrong design? Or does your role begin later on? Are you an "extra" on the set?

True public appreciation of our outdoors, and historic sites comes only from an exposure to both the physical resource and information about that resource - - either one by itself won't work. Historically, parks professionals have viewed their job as primarily that of providing opportunities to use resources. The knowledge about those resources, and how to use them, was considered to be the responsibility of each visitor. Some visitors would do their "homework"; most would not. In that situation, appreciation develops minimally, if at all. And, in the absence of appreciation, resource decline is inevitable.

A little reflection (or library research) will quickly reveal America's public parkland's history as having been cyclical: long periods of extensive budgetary neglect, interspersed with brief periods of high profile reinvestment and public atonement! Overuse and misuse was invariably blamed on an inadequate supply of public lands! And, the prescribed remedy is equally predictable: buy more land! Perhaps we should have been making America more like a park instead of accentuating the differences between ownership? You do find yourself wondering how things might be different today if our past national focus had been on building public appreciation for ALL lands, not just acquiring those deemed worthy of "protection." Expanding the public lands empire doesn't insure public land appreciation - it may even have the opposite effect. Achieving a balance between resources and their interpretation requires a conscious elevation of goals from protection to appreciation. In past years, whenever budget reductions were mandated in parks, we cut interpretation - - sometimes completely out of the system (like a cancer?)! Given a legacy of balance, cutting interpretation would have been as unthinkable as selling off the public lands to balance the budget!

I'd like to share with you two basic truths and a challenge. The truths are: 1) every parcel of public land has a story to tell - why else would it be public land? and 2) only rarely is that story being told - although it's probably the land's best possible protection. The challenge obviously is to reverse this situation - make interpretation the rule, not the exception! Accepting the challenge will not be easy. It requires that you become activists and come out of your comfortable niche as scholars and get on the firing line. Stop accepting the role of an "extra" and become a "star"! You should seek to make interpretation the fundamental reason for your agency's existence. You must insist that the term "protection" include appreciation as its goal. Demand the opportunity to review all development plans for their interpretive sensitivity. Become involved in promotional efforts to insure their relevance. Assume leadership in training so that every employee has an interpretive role, including the law enforcement group. In short, seize the moment, stage a silent coup! I've just described for you, the most valued people in my organization - those who care.

I am convinced that this is your moment in conservation history. The long era of "protection through acquisition" is gradually drawing to a close. The budget-busting era of "protection through management" is forcing us to look for new funding mechanisms (which still may not be adequate). But the idea of protection through enlightened self- interest is just waiting for you to nurture it into the most successful strategy for conservation that America has ever known. And it all begins by building appreciation and pride! I hope you will accept the challenge. I doubt that you have a choice!

Frankly, I don't know anyone better qualified than our interpretive specialists to set the agenda for our public lands. You best represent the Marshalls, Muirs, Tildens, Sloanes, Adam's, Porters, Leopolds, Carsons, Muries, and those hundreds of writers and artists who have tried to tell us that the land is more than just resources. It is a whole collection of states of mind: adventure, opportunity, freedom, pride, and wonder. We sometimes forget that those national symbols which we cherish so much, here become the real thing! In Freeman Tilden's special way of looking at things: "It is the duty of the interpreter to jog our memories". At the very top of your daily agenda I hope you will try to jog the memories of administrators, planners, and budgeters. Remind them also that every "park" is a demonstration area - for good or for worse. A parks' existence demonstrates that someone once cared. Its' condition demonstrates that someone still does - - or does not! Its' development demonstrates our sensitivity, our awareness, and our credibility as environmental educators and resource stewards. In short, every park is a "classroom." How proud are you of the lessons being taught?

* Adapted from a keynote address at the National Association for Interpretation, Region I Workshop, Pinkham Notch, N.H., March 30, 1992.

CURRENT TRENDS AND ISSUES:

PENNSYLVANIA STATE PARKS

Roger Fickes

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Background - Pennsylvania State Parks

114 state parks
275,000+ acres
19 pools
71 beaches (18 at Presque Isle alone)
40+ sewer systems
1400 pit latrines
14 water systems
588 full time employees
1200+ wage employees during the summer
$40 million - Operating Budget
$55 million - Total Budget

Issues

Two major issues (among others) face the Pennsylvania Bureau of State Parks at this time:

1. Aging infrastructure
2. Aging staff

Infrastructure

$150-200 million backlog of roads, sanitary, and water systems, building renovation, and other infrastructure needs. In 1993 a bond issue was passed which would dedicate $17 million to state parks for infrastructure renovations.

Also, beginning in 1995, 15% per year of the realty transfer tax will be dedicated to the Bureau of State Parks for infrastructure repair, which amounts to approximately $8 million a year. Over time this "Keystone Recreation and Conservation Fund" will provide the needed revenues to bring the Pennsylvania State Park facilities up to standard.

Aging Staff

The average experience of the Bureau of State Park staff is 20 years. They have continually been asked to do more with less.

Most staff have seen every motivational technique known to man which makes it very difficult to ask them to do more for less.

Many changes in personnel over the past year causing ripple effect throughout the entire staffing structure. Many managers see recent promotional opportunities as their last opportunity before retirement. Obviously only one person can be selected to fill any given position leaving many with 20 years of experience behind.

As a side note, when I came to the organization nearly two years ago there was only one female manager in the system. Now there are five female managers, all promoted from within the system (none recruited from outside). In Pennsylvania, there are many females in the educational system, i.e. colleges and universities. However, very few, if any, apply for positions in state government (e.g., Bureau of State Parks). I do not know why!

Trends

Customer service is extremely important to the delivery of recreation in Pennsylvania. However, we are increasing our emphasis on resource stewardship. This resource stewardship emphasis is an outgrowth of strategic planning that was completed in 1991 (State Parks 2000). To place more emphasis on resource stewardship, we have developed and implemented a natural areas program and a classification system of parks.

- Multiple-use overnight parks
- Multiple-use day-use parks
- Limited overnight parks
- Limited day-use parks
- Environmental Education centers
- Specialized-use parks

The second trend that has grown from State Parks 2000 strategic plan is environmental education (teaching stewardship).

We expect to broaden the scope of our environmental education efforts (act locally, think globally). We will expand our education efforts into classrooms and schools. State parks will also become classrooms for local schools and we will administer environmental education grants to schools, conservation groups, community organizations, etc.

A specific trend of interest is our volunteerism effort. Not only the typical clean up, trail type volunteers but those who build structures. We must be wary of those more sophisticated volunteer organizations that they don't drive our planning and development programs in the name of volunteer help.

Outdoor Recreation Planning



ESTIMATING DISPERSED RECREATIONAL USE ON MICHIGAN'S STATE AND NATIONAL FORESTS

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A study to estimate dispersed recreational use on three Michigan public forests was conducted April-December 1992. Use was estimated to be 9.3 hours per acre over the period. Travelers to the forests accounted for 45% of the use and inholders within the forests who did not drive a car or truck onto the public lands accounted for 55%. Hunting, offroad vehicle use and hiking/walking were the most frequently cited principle dispersed activities.

Introduction

The state of Michigan has 6.5 million acres of public forests. There are 6 state forests totaling 3.9 million acres and four national forests with 2.7 million acres (Wells and Eidelson, 1991). Much of this public acreage remains undeveloped and open for dispersed recreation, recreation occurring without the benefit of facilities developed specifically for an activity, such as designated trails, campgrounds, etc. Examples of dispersed activities include fishing, camping, hunting, nature observation, picking berries, and ORV riding done without benefit of a human made facility.

In January of 1992, the Department of Park and Recreation Resources of Michigan State University (MSU) entered into a Cooperative Agreement with the USDA Forest Service (USFS) and into a contract with the Michigan Department of Natural Resources (DNR) Forest Management Division to estimate dispersed recreational use on the 950,000 acre Huron-Manistee National Forests and the 760,000 acre AuSable State Forest. These forests comprise approximately 1.7 million acres of public lands within dedicated boundaries of 3.4 million acres and are located in North Central Lower Michigan.

The project had a number of unique features. First was that state and national forest managers cooperated so their lands were sampled with the same instrument and procedures. The rationale for this cooperation is many fold:

1. Both ownerships are poorly signed, thus recreationists may not be certain on which lands they are recreating;

2. Their properties often adjoin, thus recreationists cross property lines during a single activity;

3. Both agencies are involved in managing for and regulating similar activities with recent cooperative efforts including promulgation of similar land use rules for off-road vehicles (ORV).

Second, the measurement of dispersed use differs markedly from the typical estimates of recreation at developed facilities. For example, at developed campgrounds, campers are congregated at known locations and mandatory registration and fees provide reasonably accurate estimates of use. Similar situations exist at trail heads, designated boating access sites, scenic overlooks and picnic grounds, interpretive centers, etc. where vehicle counters can readily be used to estimate visitation when combined with visual observations. Dispersed recreation is different. Recreationists are unlikely to be concentrated and shift locations throughout the year based on activity type. Further, one recreationist may range over a number of square miles in the course of one activity. Finally, registration may not be mandatory or voluntary and access and egress may be essentially unlimited and not under control of the land managing agency or agencies.

Third, few examples in the literature are available concerning methodology for measurement of dispersed use in a forest-wide setting especially with unlimited access, no registration and significant private in holdings. For example, James and Henley (1968) suggest cordon sampling, but it is not feasible with numerous access roads not controlled by the forest managers. Ryel et al. (1982) and Hussain et al. (1987) reported estimates of dispersed use in the Pigeon River Country State Forest in Northern Lower Michigan. Their methodology was similar to that recommended by McCurdy (1970). It was to count parked vehicles within large sample areas. Then a postcard questionnaire was left with the vehicle to determine the recreational activities of the occupants while parked, the number of people in the vehicle and the length of time the vehicle was parked within the sample area. Data was then extrapolated to estimate total dispersed use. Estimates of dispersed use over a 12 month period in the 100,000 acre forest were that use was approximately 3.5 hours per acre per year. The most common principal activities of respondents were: fishing, hunting, mushroom/berry picking and hiking/ walking. The period April through December accounted for 96% of dispersed recreational use of the Forest.

The Pigeon River Country State Forest area however, differed significantly from the Huron-Manistee and the AuSable Forests. The acreage of the Huron-Manistee and AuSable Forests was 17 times the size of the Pigeon River Forest. Second, approximately 50% of the land within the dedicated boundaries of the Huron-Manistee and AuSable Forests is private versus less than 5% in the Pigeon River Forest.

Hence, the basic methodology applied at Pigeon River was appropriate for recreationists who travel to the site with a reduction in the proportion of the forest sampled due to the immense acreage. An additional methodology was necessary for adjacent inholders. These landowners and their guests were readily able to ski, walk, ride a bicycle, horse, snowmobile or ORV across their property line to the public land without the use of a car or truck.

The objectives of this study of dispersed recreation on the Huron-Manistee National Forests and the AuSable State Forest were to:

1. Estimate dispersed recreational use hours and key dispersed activities for each forest.

2. Determine the management implications of this use.

3. Explore improvements in methodology for estimating use on large acreage with limited financial and personnel resources.

Methods

To meet the objective of estimating dispersed use on a forest-wide basis, and taking into account substantial differences between various parts of the forests, sample areas were chosen on a stratified, random basis across the 1.7 million acre public area. Strata selected were the 7 Ranger Districts in the Huron-Manistee and the 3 Forest Areas in the AuSable. Within these strata, the most convenient division of lands that would allow random selection of a set of sample of areas from each strata were forest compartments. On the AuSable, these compartments averaged about 1,750 acres in size, while on the Huron-Manistee they were considerably smaller, averaging approximately 800 acres per compartment.

Compartments were randomly selected within each forest area to sample 5-6% in each strata. For the Huron-Manistee, compartments were paired to provide a comparable size to the AuSable compartments. The total area sampled was 5.1% in the AuSable (39,050 acres) and 5.8% in the Huron-Manistee (55,100 acres).

To sample tourists (those who drive to the forest and park), once compartments had been selected they were grouped into clusters for ease of travel by researchers. Clusters typically contained 6 sample compartments. Travel distance among the compartments within a cluster were typically 80 miles. In addition, researchers might have to travel up to 75 miles one way to reach the cluster from their home base centrally located within the forests.

Ten sample days for each cluster were selected for each season (spring April-June; summer July-September; fall October-December) for a total of 30 sample days. Based on the even division between weekend and weekday use for monitored Northern Lower Michigan State Parks, 5 weekend and 5 weekday sample days were systematically chosen with a random start for each season. Based on the Pigeon River data which showed very low dispersed use levels during the winter (Hussain et al. 1987), coupled with the likelihood of unplowed roads and budget constraints, the authors and the agencies mutually decided not to sample during January - March.

On a cluster's sample day, a researcher driving a two wheel drive vehicle would visit each compartment in the cluster. No developed recreational sites (should there be any within the cluster) would be sampled. At all other locations, all vehicles visible from roads, parked within or adjacent to the each sample compartment on public lands or road rights of way, would be sampled by counting the vehicle, recording the date on a vehicle log for each compartment and placing a business reply postcard questionnaire on the windshield of the vehicle. If the occupants of the vehicle were present, the card would be handed to them and if they were ready to leave, the researcher would encourage them to complete the questionnaire at that time and would receive it when they had done so. Researchers typically spent 1 hour in each compartment with 20 minutes drive time between compartments. Sampling was done between 8 AM and 6 PM. Researchers varied their routes through the clusters to maximize the number of different times of day they sampled any given compartment. Two researchers worked 5 days per week for 9 months on the field portion of this project. Once post cards were returned to the authors, the data was entered for analysis using SPSS PC.

Data were weighted to account for length of stay bias. Length of stay bias occurs when parties recreate on a site for differential lengths of time. For example, one party may be there 1 hour, while another may be parked for 48 hours. This provides a much greater chance of sampling those staying 48 hours than those staying 1 hour. The weighting procedure followed was to weight cases by the reciprocal of the number of hours the car was parked at the site where sampled (e.g. for example 1/1 for 1 hour and 1/48 for 48 hours).

Landowners within the sample compartments were identified by county plat book and their address located through the office of the county assessor. A mail questionnaire with postage paid return envelope was sent to a systematically selected sample of 50% of these landowners from each forest. It asked about the dispersed recreation use of the adjacent public lands April-December 1992 when the landowner, members of their household and guests didn't park a car or truck on the public lands or on a public right of way. The number of landowners identified in this manner is likely to be conservative as parcels less than 5 acres in size are unlikely to be separately listed in plat books. Hence, the dispersed use landowners make of the public forest is likely to be somewhat greater than that identified by this methodology. Two mailings of the landowner questionnaire were done, the first in March 1993 and a second, certified mailing in April 1993.

Results and Discussion

April-December 1992, 1,531 vehicles were counted and sampled in the compartments. Of those, 826 (54%) of the drivers responded. For the mail questionnaire, of the 679 landowners sampled 45 had invalid addresses identified by the US Postal Service. Of the 634 with valid addresses, 460 (73%) responded.

Dispersed Use Estimation

Dispersed recreational use hours of tourist recreationists for each forest were estimated on a seasonal basis by multiplying:

1. the mean number of people per vehicle,
2. the mean hours of stay per vehicle,
3. a factor that extrapolates the size of the sample areas to the size of the entire forest,
4. a factor that extrapolates the 10 sample days in each season to the number of days in a season (spring, summer, fall), and
5. a factor that extrapolates the mean hours of stay per vehicle in each season to the average hours of daylight per day in each season. (This was done as sampling was only carried out for 1 hour on a sample day in a given compartment. Thus a person there for 5 hours in a day with 15 hours of daylight had only a 1 in 3 chance of being sampled, even on a sample day.)

Adjacent landowners computed their dispersed use hours and those of their households and guests over the April-December period for the nearby public forest. The mean was then extrapolated by a factor that included all named ownerships in the sample compartments. This was then multiplied by a factor that extrapolated those results to the entire forest.

Table 1 (next page) shows the aggregated dispersed use estimate for the forests during April-December 1992. Approximately 45% of the estimated use was by tourist recreationists and 55% by adjacent inholders and their households and guests. Use levels were below one 12-hour recreational visitor day per acre. This level of use offers substantial opportunities for solitude.

Dispersed Activity Implications

The main activity reason for tourist dispersed recreationists being found in the sample forests is shown in Table 2.

Hunting was the most frequently cited main reason for visiting the forest. Species that were legal to hunt during the sampling period included wild turkey (spring, fall) ruffed grouse/woodcock (late summer, fall) and white-tailed deer (fall). However, activities related to deer hunting such as blind building, baiting and scouting were legal throughout the sampling period, and many reported they were involved in these deer hunting activities in September (late summer) prior to the October 1 (fall) opening of archery deer season.

ORV riding was much more likely to be cited in the AuSable State Forest rather than the Huron-Manistee National Forests. Both forests have identical ORV regulations (all areas closed unless posted open) and no designated ORV riding areas or trails were sampled. However, law enforcement on the state forests is limited to conservation officers, who are also responsible for fish, wildlife and environmental law enforcement on public and private lands. Their staffing level is approximately 1 officer per 175,000 acres of public and private land. Conversely, U.S. Forest Service Special Agents and Level II officers can both enforce National Forest ORV regulations and issue citations. Their staffing levels greatly exceed those of conservation officers and their duties are confined only to national forest lands. Also, the Forest Service had closely cooperated with the Cycle Conservation Club, a statewide ORV group, to organize volunteer safety patrols on the Huron-Manistee to provide peer pressure to keep riders on designated trails and in designated areas.

Table 1. Estimate of dispersed recreation hours during April-December 1992 for tourists and adjacent landowners on the Huron-Manistee National and the AuSable State Forests.

Forest/Visitor Type	Recreation visitor hours (thousands)	12-hour recreation visitor days (thousands)	Recreation hours/acre
Huron-Manistee			
Tourist	3,564.3	297.0	3.8
Adjacent landowner	4,369.0	364.1	4.6
Total	7,933.3	661.1	8.4
AuSable			
Tourist	3,653.5	304.5	4.7
Adjacent landowner	4,587.7	382.3	6.0
Total	8,241.2	686.8	10.7
Combined			
Tourist	7,217.8	601.5	4.2
Adjacent landowners	8,956.7	746.4	5.2
Total	16,174.5	1,347.9	9.3

Table 2. Percentage of tourist dispersed recreationists citing activity as main reason for visit to the Huron-Manistee National or AuSable State Forests during April-December 1992.

Activity	%		
	Huron-Manistee	AuSable	Combined
Deer hunting	44.8	34.4	39.8
ORV riding	1.8	25.4	12.1
Grouse/woodcock hunting	6.2	11.7	8.7
Fishing	7.8	4.0	6.2
Nature observation	4.3	7.7	5.8
Hiking/walking	5.2	2.2	3.9
Picking berries/mushrooms	6.1	0.6	3.7
Other hunting	5.2	0.6	3.1
Canoeing	2.2	2.0	2.1
Turkey hunting	2.3	1.1	1.8
Swimming	0.0	2.9	1.3
Horseback riding	1.4	0.2	0.9
Camping	1.0	0.4	0.7
Backpacking	0.2	0.0	0.3
Other activities	11.6	7.2	9.6
Total (a)	100.1	100.2	100.0

(a) Total may not add to 100.0% due to rounding.

When landowners were asked to identify the most important dispersed use they, their household and guests made of the adjacent public forest without driving a car or truck onto the public lands or a public right of way, they most often cited deer hunting (Table 3).

Table 3. Percentage of adjacent landowners citing activity as most important dispersed recreation on nearby Huron-Manistee National or AuSable State Forests during April-December 1992.

Activity	%		
	Huron-Manistee	AuSable	Combined
Deer hunting	44.2	43.5	43.8
Hiking/walking	26.8	27.9	27.2
Nature observation	7.9	5.2	6.7
ORV riding	4.2	7.1	5.5
Snowmobiling	2.6	5.2	3.8
Fishing	5.3	1.3	3.5
Picking berries/mushrooms	2.1	3.9	2.9
Grouse/woodcock hunting	1.1	2.6	2.0
Horseback riding	1.6	1.3	1.4
Turkey hunting	0.5	1.3	0.9
Swimming	1.1	0.0	0.6
Camping	0.5	0.0	0.3
Other hunting	0.5	0.0	0.3
Other activity	1.6	0.6	1.2
Total	100.0	99.9	100.1

(a) Total may not add to 100.0% due to rounding.

An activity that was cited much more as the most important use by landowners than tourists cited as their main reason for visiting the forest was hiking/walking. ORV use was less likely to be cited by landowners than by tourists to the AuSable State Forest.

The ever more numerous gateways to the public forests as a result of fragmentation of inholdings and the development of vacant land have resulted not only in landowner households accessing public lands but also guests. When asked how many people were in their household, landowners on the AuSable had a mean response of 2.6 and on the Huron-Manistee 2.5. However, when asked how many members of their household and guests accessed the public lands without a car or truck from their inholding to participate in the most important activity, a mean of 6.0 people did on the AuSable and 6.2 on the Huron-Manistee.

Of the landowner respondents, 71.3% in the AuSable and 68.7% in the Huron-Manistee had first or second homes on their inholding. This concentration of homes can encourage access to the forest on a year-round basis and provide support facilities for household members and guests on the doorstep of the public lands regardless of holidays or the weather.

Methodology Refinement

Two major refinements to methodology are suggested as a result of this study. Both are designed to increase efficiency while not detracting from the randomness of sample site selection.

First, instead of randomly selecting single 1,750 acre compartments within a ranger district or forest area, compartments should be paired or grouped in threes. This allows the random selection of one compartment group or pair to account for a larger amount of forest area. This results in fewer compartment pairs or groups that need to be selected and cuts drive time between compartments. During 1993-1994 in Michigan's Upper Peninsula, this strategy was used in a dispersed recreation study to select sample compartments on the Hiawatha National and the Lake Superior State Forests. It resulted in an ability to sample 10% of the forest area versus 5% in the Huron-Manistee/AuSable study with a decrease in drive time between compartments.

Second, profitable use of the drive time between sample compartments is possible. In the current Upper Peninsula study, unstaffed parking areas at developed day use facilities on the travel route are being sampled. The same postcard questionnaire that is used with dispersed tourist recreationists is used and baseline data is being gathered about use of these sites. This is done by simply coding the site location in a manner that allows differentiation between developed and dispersed sites. Developed day sites include motorized and non-motorized trail heads, boat launches, picnic areas and historic markers. Approximately 1/3 of these developed, unstaffed day use facilities within the two forests are being sampled.

Conclusions

Cordell et al. (1990) suggests that the demand for many dispersed recreational activities is likely to increase over the next 50 years. Unfortunately little research attention, especially longitudinal research, has been devoted to the amount and type of dispersed use on the public forests outside of wilderness and primitive areas. Since less than 1% of the forest land in the Huron-Manistee National Forests and the AuSable State Forests is designated wilderness and none of these areas were sampled in this study, dispersed use in the working/multiple use portions of these public forests appears to be substantial. It is vital that this use be understood and considered in the planning and management of public forests. The methodology presented provides a cost effective way to estimate dispersed use and could be adapted to most forest areas.

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Acknowledgments

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IDENTIFIED RECREATION OPPORTUNITIES AND PREFERENCES FOR THE LOWER PENOBSCOT RIVER, MAINE

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The Penobscot River has been the focus of a major Atlantic Salmon restoration effort for the last 25 years. The river has received national and international attention with the proposal of an additional 38-megawatt hydroelectric facility on its main stem. This study was conducted in response to a need to identify recreation enhancement and mitigation options related to licensing of the proposed facility. Our research to date describes recreation use patterns and preferences, and associated perceptions of recreation experiences and constraints. Detailed findings are published in Maine Agricultural and Forest Experiment Station Miscellaneous Report No. 381: Penobscot River Recreation Study, May 1994. Additional research will look more fully into factors related to leisure constraints in the study area.

Introduction

The Penobscot River drains one-fourth of the State of Maine, approximately 8000 square miles, an area greater in size than the State of Massachusetts. The Penobscot watershed has a diversity of history, topography, and current uses. Generally considered an outdoor enthusiast's paradise throughout its expanse, the watershed plays an intimate part in the fabric of Maine life. The Penobscot tributaries begin in the northwest reaches of the state and course their ways through timberlands and farmlands, urban areas and coastal regions. The Penobscot River provides bountiful wild water recreation and multitudes of locations for quiet solitude. The river's mighty power is put to work as it leaves Maine's unorganized territories and passes through into the urban heartland. The legislature and local governments have responded to the opportunities created by the river, and to the diversity of interests in the watershed. Reckless indifference to the watershed has been replaced by a growing sense of nurture and care for the waters, while retaining both the working and recreational opportunities afforded by the Penobscot. Significant areas addressed through legislation include shoreland zoning, air and water pollution, deteriorating dams, preservation of wetlands, fisheries issues, and pesticide issues.

Methodology

The study was developed under the auspices of the Parks, Recreation, and Tourism Program of the University of Maine in the summer of 1992. The study area was defined as the portion of the lower Penobscot River from Bangor to Milford, Maine. The intent of the study was to gather information on area residents' perceptions of the river, the quality of recreation on the river, recreational use rates, and barriers to river recreation. The study also sought to determine residents' attitudes toward and desires for different types of recreation that have been proposed for the specified region of the Penobscot River.

The study was accomplished through the use of a mail-out survey. A random sample of households from the nine communities in closest geographic proximity to the study area was selected as the survey population. The sample was stratified based on individual populations of the chosen communities.

We used the Total Design Method (TDM) to develop the survey and, due to time and budget constraints, a modified TDM to administer the survey (Dillman 1978). In September 1992, we mailed a map of the study area and a questionnaire to each of the households in the sample. Two sets of follow-up postcards were mailed in October and November, to remind people to return their surveys and to thank those who had already completed their surveys. Replacement questionnaires were mailed to those who requested them.

Results

The following are selected results from the survey, and highlight many of the important issues associated with the study. The key issues that we identified are:

1) How do people use the river now?
2) How do people want to use the river?
3) What constraints limit participation in river recreation?
4) How does access affect recreation?
5) What adds to or detracts from the quality of a recreation experience?
6) What potential recreation opportunities exist?

A total of 555 questionnaires were completed and returned by persons actually living in the survey region. Twenty-seven percent of the questionnaires were answered by women and seventy-three percent were answered by men, a result likely influenced by the household lists. The respondents varied in age from 22 to 88 years of age. Only 8% of the respondents were less than 30 years old. More than 45% of the respondents were 31 to 50 years old, and about 35% were 51 to 70 years old. Three-quarters of the respondents have lived more than ten years in the study region. The average age of male and female respondents was nearly equal, and the men generally had lived in the region about 20% longer than the women. More than one-quarter of the respondents belonged to a conservation or sports organization. The proportions of male and female respondents belonging to such organizations were nearly equal. People who were members of such organizations used the study area about 1-1/2 times more frequently than did nonmembers.

How Do People Use The River Now?

Seventeen percent of the respondents had never used the river for recreational purposes. Of those respondents who had used the river, the date of their last visit ranged from July 4, 1931, to a few days before completing the survey. The median last visit occurred three months before the time of the survey. About 32.3% of the respondents visited within the previous 2 months, 49.6% visited within the previous 4 months, and 54.2% visited within the previous year. At least 62.7% had visited in the previous 2 years, but 31.9% had not visited the study area in more than 4 years.

When questioned about 22 different types of river recreation, between 30% and 50% of the respondents indicated a preference to use the area near the river primarily to relax, walk or hike, or to picnic (Figure 1). Canoeing or kayaking, fishing from the bank, bird watching, and fishing from a boat were the next most popular activities, according to approximately 20% to 30% of the respondents. These activities were followed closely by motorboating, bicycling, and cross-country sl ing (7% to 11% participation). Participation rates for the remainder of the 22 activities ranged from less than 1/2% to less than 7%.

Table 1. Characteristics of the 1992 Penobscot River recreation study respondents.

Characteristics	Male	Female
Average Age (Median Age)	50 years old (48 years old)	49 years old (47.5 years old)
Average Number of Years as an Area Resident (Median Number of Years)	30 years (27 years)	25 years (23 years)
Typical Employment Status	Full Time	Full Time
Median Household Income	$40,000-$50,000	$25,000-$30,000
Average Number of People that Income Supports	2.83 persons	2.17 persons
Percentage of Respondents who are Members of a Conservation or Sporting Organization	28.0%	26.4%
Median Number of Months Since Last Visit to the Penobscot River	3 months	3 months

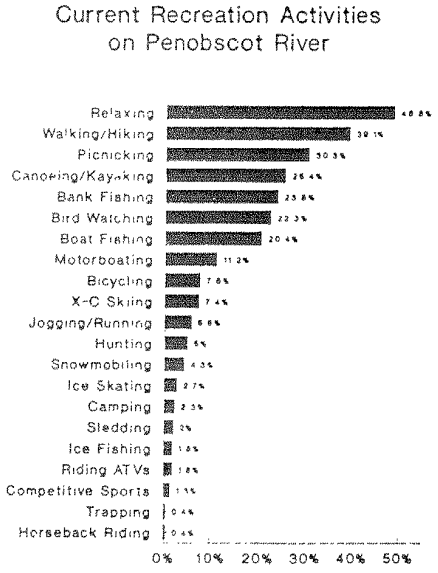


Figure 1. Current recreation on the Penobscot River.

How Do People Want To Use The River?

To determine the desirability of those same 22 recreational activities for the study area, respondents were asked to rate the activities on a scale ranging from extremely desirable to not very desirable. We combined the "extremely desirable" and "quite desirable" responses to produce the percentages shown in Figure 2. In signifying their desires, the respondents again showed a definite preference for using the area near the river to relax or to walk or hike. The number of respondents who would like to have motorboating opportunities on the Penobscot River represents a six-fold increase over current motorboat use. The desires for picnicking and fishing opportunities are double the rates of current participation. About two-fifths of the respondents would like to use the area near the river for bird watching, horseback riding, cross-country skiing, motorcycling, and jogging or running. Currently, opportunities for cross-country skiing and jogging or running are limited, and opportunities for horseback riding and motorcycling are almost nonexistent.

The lack of either real or perceived opportunities is reflected in the large number of respondents desiring an activity versus the number of respondents currently participating in that activity in the study area. Of the 22 types of recreation listed, the number of people who desired a particular type of recreation was 1-1/2 to 110 times as great as the number of people who currently use the river, or the area near the river, in those ways, except for canoeing/kayaking and bicycling.

Canoeing/kayaking and bicycling were among the bottom 5 of 22 types of recreation ranked in order of desirability, and were the only two categories in which there were fewer respondents who desired the activity than currently participated in those activities in the study area. Specifically, only 15.9% of the respondents believed canoeing and kayaking were desirable in the study area, yet 25.4% canoed or kayaked in that same portion of the river. Similarly, only 4.8% of the respondents thought that bicycling was a desirable type of recreation along the river in the study area, yet 7.6% of the respondents bicycled in the same area.

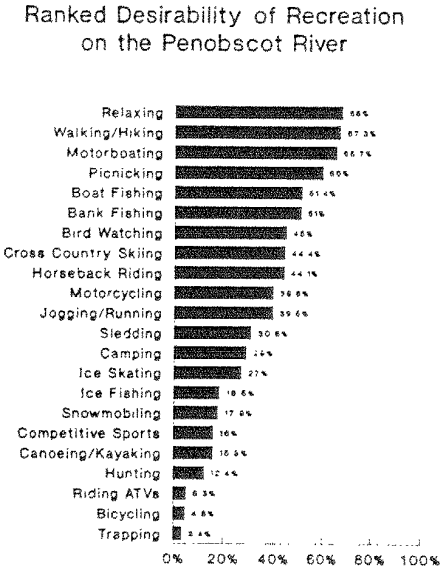


Figure 2. Ranked desirability of recreation on the Penobscot River.

What Constraints Limit Participation In River Recreation?
Constraints to recreation in the study area, listed in Table 2, are ranked according to significance as indicated by respondents.

Table 2. Constraints to Penobscot River recreation.

Category	Percent
Don't know what's available	52.3
Lack of access	50.0
Not enough free time	50.2
Programs, etc. not available	48.4
Not sure how to use resources	40.7
Work is main priority	33.6
Too much litter	26.4
Too many family obligations	25.8
Not enough money	25.5
Family & friends limit me	19.9
Don't feel safe	19.8
Don't feel like doing anything	19.5
No one to do things with	15.0
Location not appealing	13.2
River recreation not appealing	12.7
Don't have the physical skills	12.4
Not fit enough	10.2
Don't like people who go there	5.0

Constraints to recreation are a key issue in this study because two-thirds of the constraints identified can be addressed by management. Additionally, constraints are interrelated to other key issues identified above. One example: How do people want to use the river? Half the respondents indicated that they do not know what is available and that programs and facilities are not available. Another 40% are not sure how to use the resources that are available. Still others report they either are not fit enough or do not have the physical skills to use the river. Another example: How does access affect recreation? Half the respondents indicated that lack of access limits their recreational use of the river. A third example: What adds to or detracts from the quality of a recreation experience? Respondents also noted constraints such as too much litter, not feeling safe, unappealing locations, and finding river recreation unappealing. Management can address the constraints through informational and educational means, proper facility design, maintenance, and security. Efforts geared toward providing high quality recreation experiences help give appeal to river recreation.

How Does Access Affect Recreation?
The issue of how access affects recreation is graphically displayed in Figures 3 and 4. These two figures take on increased emphasis in light of the fact that over 50% of the respondents identified lack of access as a leading constraint. Just under 57% believe access in the study area is fair to very poor, indicating that a fair access rating is considered by many as constraint. Forty-seven percent of the respondents thought that their recreation would increase at least some, to perhaps a great deal, if access were improved.

Because of three existing dams, the remnants of one dam, and a natural ledge obstruction on the main stem of the Penobscot River, the study area is somewhat segmented. When we examined previous studies, we found that field data on actual river use showed heavier use in segments where access was good, and almost no use in segments where access was poor. In response, additional access in the form of new boat launching facilities, purchases of undeveloped land (subsequently donated to a local land trust organization), and conservation easements in the riparian zone has been provided by the local utility.

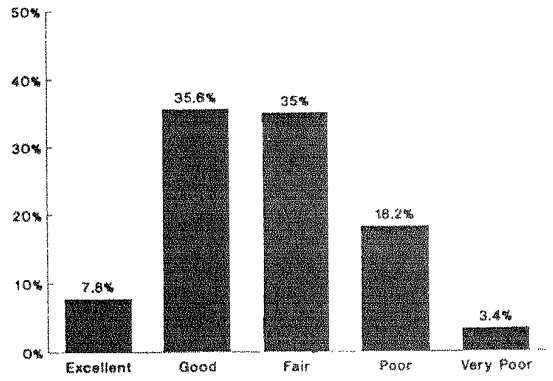


Figure 3. Recreation access rating.

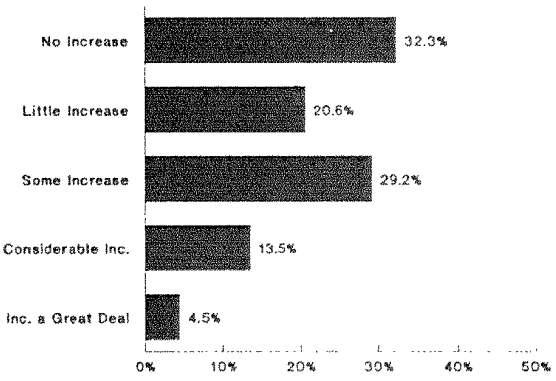


Figure 4. Recreation use if access improved.

What Adds to or Detracts from the Quality of a Recreation Experience?
Figures 5 and 6 show what adds to or detracts from respondents' recreation experiences. The opportunity to observe or interact with wildlife is valued by respondents as indicated in several portions of the survey. In particular, a person can see or encounter bald eagles, osprey, waterfowl, moose, black bear, migrating Atlantic Salmon, muskrats, beaver, raccoons, etc. Of importance to managers are the conflicting factors that affect the quality of a recreation experience. For example, domestic animals add to the recreation experience for some respondents, and detract from the experience for others. Likewise, meeting other groups of people has a positive effect for some and a negative effect for others.

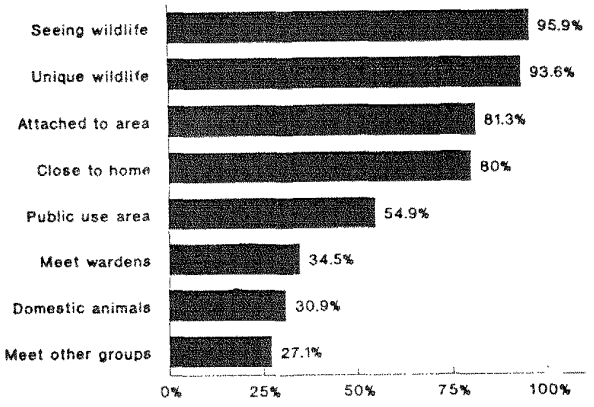


Figure 5. Adds to quality of experience.

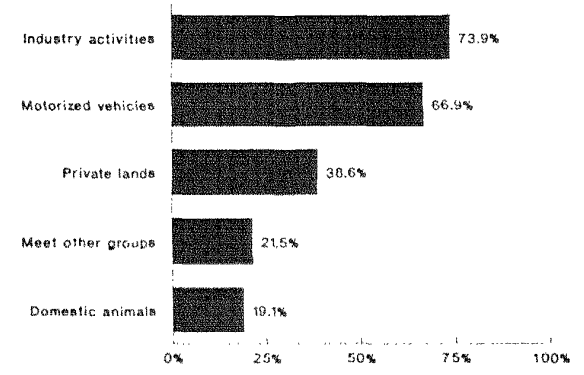
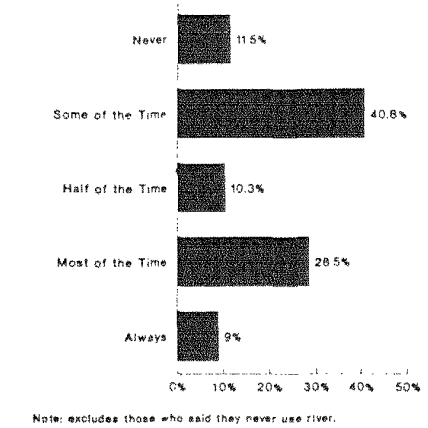


Figure 6. Detracts from quality of experience.

A pertinent question for managers is: Can the study area provide high quality recreation? The results of the survey (Figure 7) show that a high quality recreation experience is an attainable goal.



Note: excludes those who said they never use river.

Figure 7. Frequency of high quality recreation experience.

What Potential Recreation Opportunities Exist?
Various groups in the region have proposed facilities such as visitor centers and trail systems. In reviewing visitor center attributes important to respondents (Table 3), we noted again the importance of wildlife, the importance of preferred activities such as picnicking, and the importance of information. It is possible to locate visitor centers near undeveloped areas that have abundant wildlife. At least one location in the study area could include a fish-viewing window, enabling people to watch migrating species such as Atlantic Salmon, eels, and alewives, or resident species such as bass and pickerel.

Table 3. Preferred visitor center attributes.

Visitor Center Attributes	Percent
Wildlife areas	74.3
Picnic areas	67.8
Information panels	61.7
Historic artifacts	55.5
Brochures	53.7
Fish viewing window	50.3
Playgrounds	48.9
Dioramas	44.1
Hands-on displays	34.6
Video displays	33.1
Interactive displays	30.7
Bookstore	30.0
Slideshows	28.0
Gift shops	18.5
Commercial & industrial tours	18.3
Cafeteria	17.5

Trail attributes preferred by respondents (Table 4), show preferences for things that would enhance interaction with wildlife -- a top priority among respondents throughout the survey -- and for things that would provide information, such as signs and brochures. Additionally, it is interesting to note that although very few respondents felt that canoeing (15.9%) and bicycling (4.8%) were currently desirable, almost 60% preferred those activities when associated with a trail system.

Table 4. Preferred trail attributes.

Trail Attributes	Percent
River views	86.4
Limited access	82.7
Through forests	80.0
Wildflowers	75.3
Loop trails	72.7
Away from neighborhoods	71.3
Solitude	70.1
Vista areas	63.4
Nature descriptions	61.6
Picnic areas	59.2
Directional signs	58.9
Brochures	58.7
Restrooms	58.6
Canoe access	57.9
Designated bike trails	56.4
Through open areas	49.5
Patrolled trails	43.7
Long trails	39.2
Natural trails	27.7
Near roads	18.8
Manicured lawns	12.5

Management Implications

1) Baseline studies now exist.
2) Baseline studies identify constraints that can be addressed.
3) Incompatible uses should be identified.
4) Multiple areas versus multiple-use areas should be considered.
5) Private sector funding may be available for studies.

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OUTDOOR RECREATION OPPORTUNITIES AND LAND USE CHANGE IN VERMONT'S LAKE CHAMPLAIN BASIN

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Outdoor recreation resources are eroding in Vermont's Lake Champlain Basin due to urban expansion. This study measured urban growth in the Basin and identified critical areas for open space protection. The study's hypothesis, that there was no difference between the Champlain Basin and other parts of urbanizing New England that have lost outdoor recreation resources, was accepted.

Problem

Vermont's Lake Champlain Basin is the fastest growing region in Vermont. Its population increased 11 percent during the past decade from 331,125 persons in 1980 to 368,172 in 1990 (USDC 1980-90). This population growth and accompanying economic development creates a demand for rural open space surrounding the Basin's cities and suburbs. This conversion of rural to urban land destroys both outdoor recreation resources and the public's access to them.

Study Hypothesis and Objectives

The study hypothesis was that there is no difference between Vermont's Lake Champlain Basin and other parts of New England that have urbanized and lost outdoor recreation resources as a result of the urbanization process. One might assume that because of Vermont's historically rural nature and long standing environmental protection laws that this region would not succumb to the intensity of urbanization that has affected major portions of southern New England, Maine, New Hampshire, and other parts of the northeast for the past several decades. The study was designed to test this assumption. Its objectives were: (1) to measure the urban consumption of rural lands in Vermont's Lake Champlain Basin and (2) to identify critical outdoor recreation resources for protection from urban encroachment.

Vermont's Lake Champlain Basin

Vermont's Lake Champlain Basin is 55 miles wide and 120 miles long. The Lake itself is 109 long, has a maximum width of 11.2 miles, and a 587 mile shoreline. The Green Mountains form the eastern boundary of the Lake's watershed, and together with rural open space represent the Basin's major outdoor recreation and tourism resources. Six major rivers drain the Basin and with their associated wetlands provide an abundance of recreation opportunities for outdoor enthusiasts (New England River Basins Commission 1975).

Basin dairy farming has been declining in rapidly urbanizing counties like Chittenden. Many farms have been subdivided for residential, commercial, and industrial purposes stimulated by profits taken from increasing land values and the costs incurred from rising property taxes (State of Vermont 1992). In this rural to urban conversion process, privately owned open space, which has often provided free public recreation, is eliminated as an outdoor recreation resource (Table 1).

Table 1. Decline in the number of Vermont dairy farms in Vermont's Lake Champlain Basin, 1991-1993.

County	1991	1992	1993	% Change
Addison	381	184	170	-7.0
Caledonia	177	184	170	-4.0
Chittenden	113	106	101	-12.0
Franklin	515	508	498	-3.0
Rutland	181	177	180	-0.6
Washington	90	87	85	-6.0

Source: Vermont Department of Agriculture

Method

The study included 133 towns in Vermont's Lake Champlain Basin which were divided into five study areas of 24 to 30 towns each. Two towns in each of the 5 planning areas, having the highest and lowest populations, were further studied for growth rate impacts on remaining open space. Land use in each of the 5 planning areas was studied using GIS generated maps (State of Vermont 1986). Three socioeconomic characteristics of the population were used to measure urban expansion: population growth, school enrollments, and new housing permits (State of Vermont and the Vermont Rural Studies Center 1993). Three other socioeconomic characteristics of the highest and lowest populated towns were studied to determine if population migrations were occurring from towns of high population density to towns of low population density. They included residents' age, household income, and occupation. Thirty students enrolled in an outdoor recreation planning course at the University of Vermont's School of Natural Resources collected and analyzed the data.

If a town showed more than average growth in population, school enrollments, and new housing starts it was classified a "high growth" town. If two out of these three elements showed above average increases for the decade a town was classified as a "medium growth" town. If only one element showed above average growth the town was considered a "low growth" town. Some towns actually showed zero or negative growth in one or more variables.

Results

The population of the Basin and its five planning areas, as defined by this study, averaged 11 percent over the past decade from a low of 9 to a high of 13 percent (Table 2). Almost all of this growth took place in communities surrounding established city centers and extended outward towards the rural towns. School enrollments paralleled population growth increases with central city schools showing no growth or declining enrollments, suburban towns showing rapid growth, and most outlying rural towns currently maintaining level enrollments. As expected, new housing permits coincided with the first two growth indicators with the greatest number of new housing starts located in the satellite communities. Using the procedure described in the method section growth indicators were computed for each of the 5 basin planning areas, and the results shown in Table 3.

The planning areas containing the cities of Burlington and Rutland (Planning Areas 2 and 5) had the largest percentage of towns, 38 percent and 39 percent, with high growth rates. Medium and high growth towns accounted for 66 percent and 91 percent of the communities located in these same two planning areas. The remaining three planning areas contained a lower percentage of high growth towns but still registered 16 to 17 percent. The high, medium, and low growth towns were then plotted on a map of the basin to determine if any growth patterns were evident.

Table 2. Planning area population changes, Vermont's Champlain Basin, 1980-1990.

Planning Area	1980	1990	% Change
1	50466	55883	11
2	129681	146652	13
3	71476	78120	9
4	27697	31183	13
5	51805	56334	9
Total Basin	331125	368172	11

Source: 1980-1990 U.S. Census Bureau

Table 3. Lake Champlain basin growth centers, 1980-1990.

Planning Area and Central City	Percentage of Towns in Growth Category		
	High	Medium	Low
1 St. Albans	17	38	28
2 Burlington	38	28	34
3 Barre	14	41	45
4 Middlebury	16	40	44
5 Rutland	39	52	9

We had assumed that urban growth in the Champlain Basin might approximate concentric circles radiating out from the Basin's urban centers. This assumption was incorrect. The pattern that did emerge was rather than growth being evenly distributed among communities surrounding urban centers it followed the major state highway corridors connecting the urban centers to other parts of the planning areas (Figure 1).

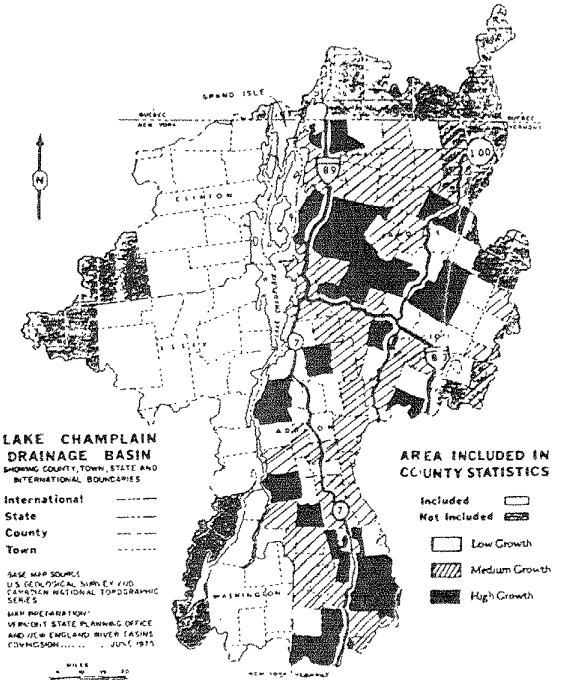


Figure 1. Growth towns and their geographical relationships in major highways in Vermont's Lake Champlain Basin.

The Basin's urban centers have consumed most, if not all, of their open space for development purposes. Outdoor recreation space protection opportunities are few. We found these to be mostly located along stream banks, wetlands, and on undeveloped, steeply sloped lands. The medium and high growth satellite communities had sufficient open space but growth pressures had resulted in high land prices and the ongoing consumption of open space primarily for residential purposes. The rural communities had ample, remaining open space and several options for outdoor recreation resource protection.

Conclusion

The study hypothesis was accepted that there was no difference between Vermont's Champlain Valley and other parts of New England that have gone through the urbanization process and lost valuable outdoor recreation space to urban expansion. All five Lake Champlain Basin planning areas have experienced significant population growth during the last decade that averaged 11 percent. This growth has been accompanied by significant land use change where the classic conversion of rural to urban land uses has occurred at a rapid rate. The communities most affected by urbanization are those closest to established cities like St. Albans, Burlington, Middlebury, and Rutland and tourist centers like Stowe. Rural land conversion is most rapid in those communities adjacent to major transportation routes including Interstate 89, Routes 7, 15, and 100.

The 133 basin towns studied were classified as those that have been urban for decades, those that are peripheral to the urban-suburban cores, and the rural towns not yet effected by growth and development. The urban centers are restricted as to the amount of open space still available for protection. What ever open space is left is primarily not suitable for other land uses. The growth towns had ample amounts of remaining open space but its value is rapidly increasing due to the demand for development space. These communities are at high risk of loosing their open space resources and must respond quickly in they wish to protect quality outdoor recreation opportunities. Finally, the rural towns, while not yet threatened by growth, are probably in the best position to plan their future land use. They have time, lower land values, and a diversity of open landscapes in their favor.

Several regions of New England have gone through the rural to urban land use change syndrome as their economies have expanded resulting growth has occurred, and rural lands consumed. Along with the economic benefits associated with growth and development these regions have, in most cases, suffered the loss of potential public open space. Vermont's Lake Champlain Basin is experiencing similar growth patterns but still is in the envious position of being able to protect selected portions of its rural, open space past for public enjoyment. The regional and municipal planning commissions, with state financial and technical assistance programs can make the Basin's future different from most metropolitan centers in the New England region that have lost the opportunity to protect valuable natural heritages.

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INDICATORS AND STANDARDS OF THE QUALITY OF THE VISITOR EXPERIENCE AT A HEAVILY-USED NATIONAL PARK

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Contemporary approaches to determining and managing carrying capacity of national parks and similar areas focus on indicators and standards of quality. The National Park Service is currently developing the Visitor Experience and Resource Protection process which adopts this approach to carrying capacity. This process is being applied at Arches National Park, Utah, through a two-phase research program aimed at identifying indicators and standards of the quality of the visitor experience.

Introduction

As the name suggests, national parks are resources of national and, increasingly, international significance. The national park system contains natural, historical, and cultural resources of great importance to the nation and, in many cases, to the international community. Given the significance of this resource base, public demand to see and experience these areas should not be surprising.

Data on national park visitation dramatically support this premise. Annual visitation to the national parks is now counted in the hundreds of millions. In the decade of the 1970s, visitation increased by 30 percent. In the 1980s, visitation rose another 35 percent. If this trend continues, the national parks can expect an additional 60-90 million recreation visits by the year 2000.

The increasing popularity of the national parks presents both an opportunity and challenge to the National Park Service (NPS). The opportunity is to fulfill the mission of the NPS "to provide for the enjoyment" of the national parks. The accompanying challenge, of course, is to conserve park resources for the enjoyment of future generations. This can prove difficult under conditions of high visitation.

Implicit in this dual mission of the NPS is the issue of the *quality of the visitor experience*. The quality of visitor experiences must be maintained at a high level for the national parks to contribute their full potential to the enjoyment of society. Moreover, high quality visitor experiences are more likely to develop public appreciation of, and support for, conservation of national park resources.

It is ironic that one of the greatest threats to the quality of national park visits is commonly seen as their increasing popularity. To many observers the national parks, at least in some places and at some times, are crowded, and this detracts from the quality of the visitor experience. In more formal terms, the use of some national parks, or portions thereof, have exceeded their *carrying capacity*.

This paper explores the theory and application of carrying capacity of the national parks. The first section briefly traces the theoretical development of the carrying capacity concept. The second section describes a process now being developed to help determine and manage carrying capacity in the national parks. The final section outlines research now underway to apply this carrying capacity process. The importance of indicators and standards of quality is highlighted throughout this discussion.

The Concept Of Carrying Capacity

The question of how much public use is appropriate in a national park is often framed in terms of carrying capacity. Indeed, much has been written about carrying capacity of the national parks and related areas. The underlying concept of carrying capacity has a rich history in the natural resource professions. In particular, it has proven a useful concept in wildlife and range management where it refers to the number of animals of any one species that can be maintained in a given habitat (Dassmann 1964). Carrying capacity has obvious parallels and intuitive appeal in the field of park management. In fact, it was first suggested in the mid 1930s as a park management concept in the context of the national parks (Summer 1936). However, the first rigorous applications of carrying capacity to park management did not occur until the 1960s.

These initial scientific applications of carrying capacity to park management suggested the concept was more complex in this new management context. At first, as might be expected, the focus was placed on the relationship between visitor use and environmental conditions. The working hypothesis was that, in absence of compensatory management, as visitor use intensity increases, it causes greater environmental impact as measured by soil compaction, destruction of vegetation, and related variables. It soon became apparent, however, that there was another critical dimension of carrying capacity dealing with social aspects of the visitor experience. Wagar (1964), for example, in his early and important monograph on the application of carrying capacity to recreation reported that his study

> *"...was initiated with the view that the carrying capacity of recreation lands could be determined primarily in terms of ecology and deterioration of areas. However, it soon became obvious that the resource-oriented of view must be augmented by consideration of human values."*

Wagar's point was that as more people visit a park, not only can the environmental resources of the area be affected, but also the quality of the visitor experience. Again, the working hypothesis was that, in the absence of compensatory management, as visitor use intensity increases, it causes greater social impacts as measured by crowding and related variables. Thus, as applied to national parks and related areas, carrying capacity has two components: environmental *and* social.

The early work on carrying capacity has since blossomed into an extended literature based on environmental and social aspects of outdoor recreation and their application to carrying capacity (Stankey and Lime 1973; Manning 1985; Kuss et al. 1990; Shelby and Heberlein 1986; Lime and Stankey 1971; Manning 1986; Graefe et al. 1984; Cole 1987; Hammitt and Cole 1987). But despite this impressive literature base, efforts to determine and apply carrying capacity to areas such as the national parks have often resulted in frustration. The principal difficulty lay in determining how much impact was too much. Theoretical development, backed up by empirical research, generally confirms that increasing visitor use leads to increasing environmental and social impacts. But how much impact should be allowed in a national park? The basic question is often referred to as " the limits of acceptable change" (Lime 1970; Frissell and Stankey 1972). Given substantial demand for public use of a national park, some decline or change in resource quality and/or in the quality of the visitor experience appears inevitable. But how much decline or change is acceptable or appropriate?

The relationship between intensity of visitor use and environmental/social impacts is illustrated hypothetically in Figure 1. It is clear that visitation causes impacts and that in the absence of compensatory management, these impacts increase with increasing visitation. What is not clear is the point at which carrying capacity has been reached. Again, the difficulty in

carrying capacity determination lies in deciding how much impact is appropriate or acceptable.

To emphasize and further clarify this issue, some writers have suggested distinguishing between descriptive and evaluative components of carrying capacity determination (Shelby and Heberlein 1986). The descriptive component of carrying capacity focuses on factual, objective data such as the types of relationships in Figure 1 (see next page). For example, what is the relationship between the number of visitors entering an area and the number of encounters that occur between groups of visitors? Or what is the relationship between the intensity of visitor use and visitor perceptions of crowding? The evaluative component of carrying capacity determination concerns the seemingly more subjective issue of how much impact or change in the recreation experience is acceptable. For example, how many contacts between visitor groups are appropriate? What level of perceived crowding should be allowed before management intervention is necessary?

Recent experience with carrying capacity suggests that answers to the above questions can be found through formulation of management objectives and development of indicators and standards of quality (National Park Service 1992; Shelby et al. 1992). This approach to carrying capacity focuses principal emphasis on defining the type of visitor experiences to be provided and maintained, and then monitoring conditions over time to assess whether or not acceptable conditions have been exceeded.

Management objectives are broad, narrative statements which define the type of visitor experience to be provided. They are based on a review of the purpose and significance of the area under consideration. Formulation of management objectives may involve review of legal, policy and planning documents, consideration by an interdisciplinary planning/management team, and public involvement.

Indicators of quality are more specific measurable variables which reflect the essence or meaning of management objectives. Indicators of quality may include elements of both the physical and social environment that are important in determining the quality of the visitor experience. Standards of quality define the quantitative and measurable condition of each indicator valuable.

By defining indicators and standards of quality, carrying capacity can be determined and managed through a monitoring program. Indicator variables can be monitored over time and once standards have been reached, carrying capacity has been reached as well. This approach to carrying capacity is central to contemporary park planning frameworks, including Limits of Acceptable Change (LAC) (Stankey et al. 1985), Visitor Impact Management (VIM) (Graefe et al. 1990), Carrying Capacity Assessment Process (CCAP) (Shelby and Heberlein 1986), and the Visitor Experience and Resource Protection (VERP) process currently under development by the NPS (National Park Service 1993).

Carrying Capacity in the National Parks: The Visitor Experience and Resource Protection (VERP) Process

The NPS has long recognized the need to apply the carrying capacity concept in parks that have been experiencing problems from increasing public use. The 1978 General Antiquities Act requires each park's general management plan to include "identification of and implementation commitments for visitor carrying capacities for all areas of the unit." Although NPS management policies and planning guidelines acknowledge this responsibility, there has been little direction or agreement on a methodology for how to identify a park's carrying capacity. Indeed, there has been no agency-wide agreement on the meaning of the term carrying capacity. Park managers are often uncomfortable saying that their parks, or areas within their parks, are receiving inappropriate or excessive use, because they lack the conclusive data and the rationale they need to make these controversial decisions.

For the past several years, NPS planners and consultants have been developing a process intended to help park planners and managers make sound decisions about visitor use. However, it is important to note that the VERP process is still being refined and has not yet been formally adopted by the NPS. The VERP process is based on many of the same elements and techniques included in the LAC and VIM methodologies. A major premise of the VERP process is that the NPS should manage visitor use continuously, the same way it manages resources. Visitor use management begins with a plan, but this is only a starting point; it continues as an iterative process of monitoring, evaluation, and adjustment. Moreover, the VERP process places principal emphasis on identification of indicators and standards of quality.

As shown in Figure 2 (see page 27), the VERP process consists of nine steps. The first six steps are requirements of general park planning, and ideally should be a part of each park's general management plan. The later steps in the process require annual review and adjustment, and are more appropriately handled through park operations and management activities.

Carrying Capacity of Arches National Park

The VERP process described above currently is being pilot-tested at Arches National Park, Utah. The purpose of this test application is to refine the VERP process and provide a model for application to the national park system. Below we describe research in progress aimed at defining indicators and standards of the quality of the visitor experience.

Arches National Park is comprised of 73,000 acres of high-elevation desert with outstanding slick rock formations, including nearly 2,000 stone arches. Most of the park's scenic attractions are readily accessible through a well-developed road and trail system. Visitation to arches has been increasing rapidly. The number of visits increased 91 percent in the decade of the 1980s, and the park received over three quarters of a million visits in 1993.

The carrying capacity research program at Arches was approached in two phases. Phase I was conducted in the summer of 1992 and aimed at identifying potential indicators of quality of the visitor experience (Manning et al. 1993). Personal interviews were conducted with 112 visitors throughout the park. In addition, ten focus group sessions were held with park visitors, park staff, and local community residents. Respondents and participants were selected through a purposive rather than random sampling procedure. Thus, data are primarily qualitative in nature. This exploratory effort was to begin learning about a variety of human-use aspects of visitation to Arches and to develop insights into potential indicators of the quality of the visitor experience. Interviews and focus group sessions were guided by a standardized questionnaire.

The questionnaire contained two major sections that focused on identifying potential indicators of the quality of the visitor experience. The first section contained a battery of open-ended questions which probed for park conditions and issues which visitors and others considered important to determining the quality of the park experience.

The second section of the questionnaire contained a battery of close-ended questions which also probed for indicators of quality. Fifty-three wide-ranging park conditions or issues were presented to respondents who were asked to indicate whether each item was considered to be a "big problem," a "small problem," or "not a problem;" a "no opinion" option was also presented. The items presented were developed on the basis of literature review, discussion with park planners and staff, and personal observations in the park.

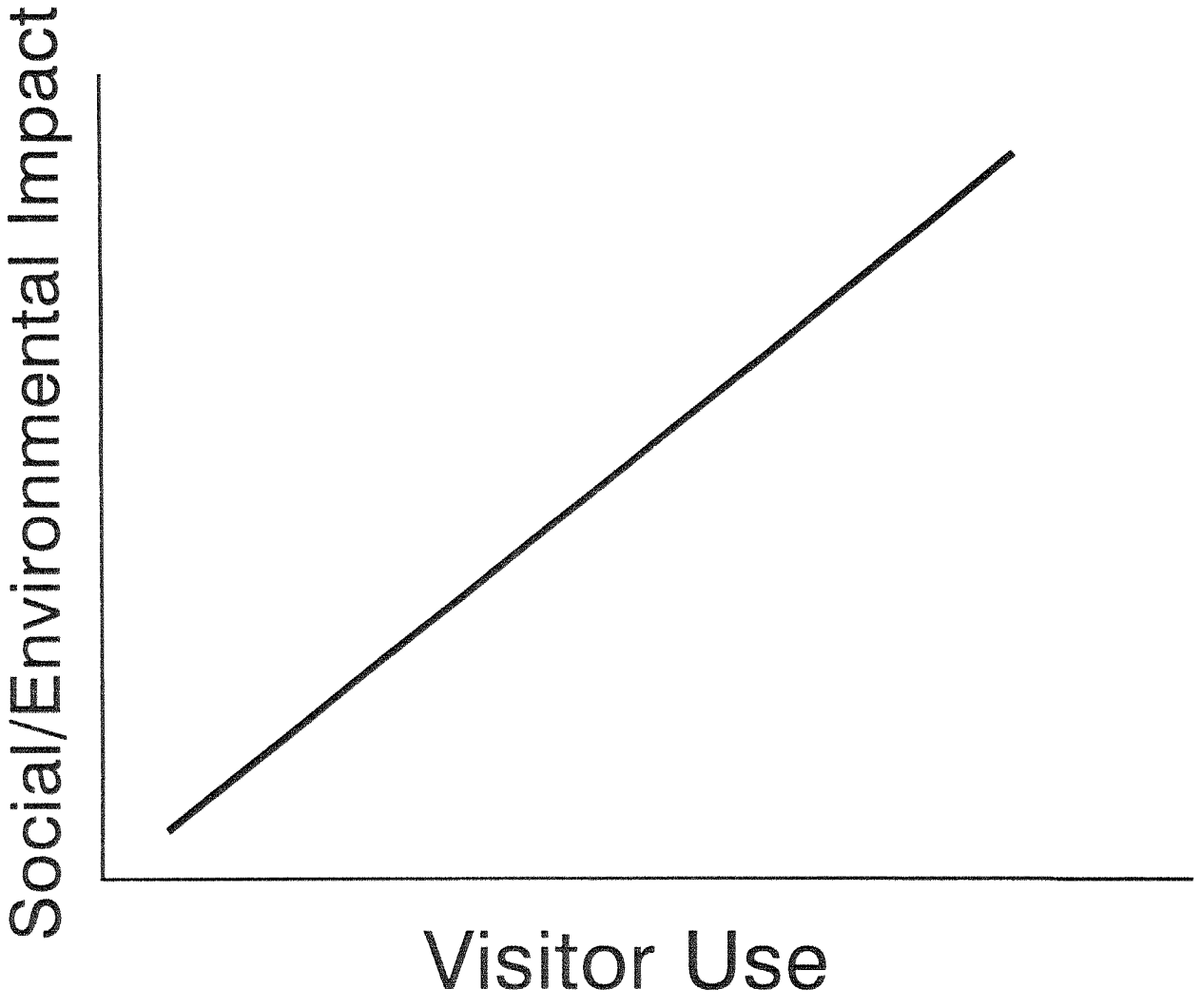


Figure 1. Hypothetical relationship between intensity of visitor use and environmental/social impacts.

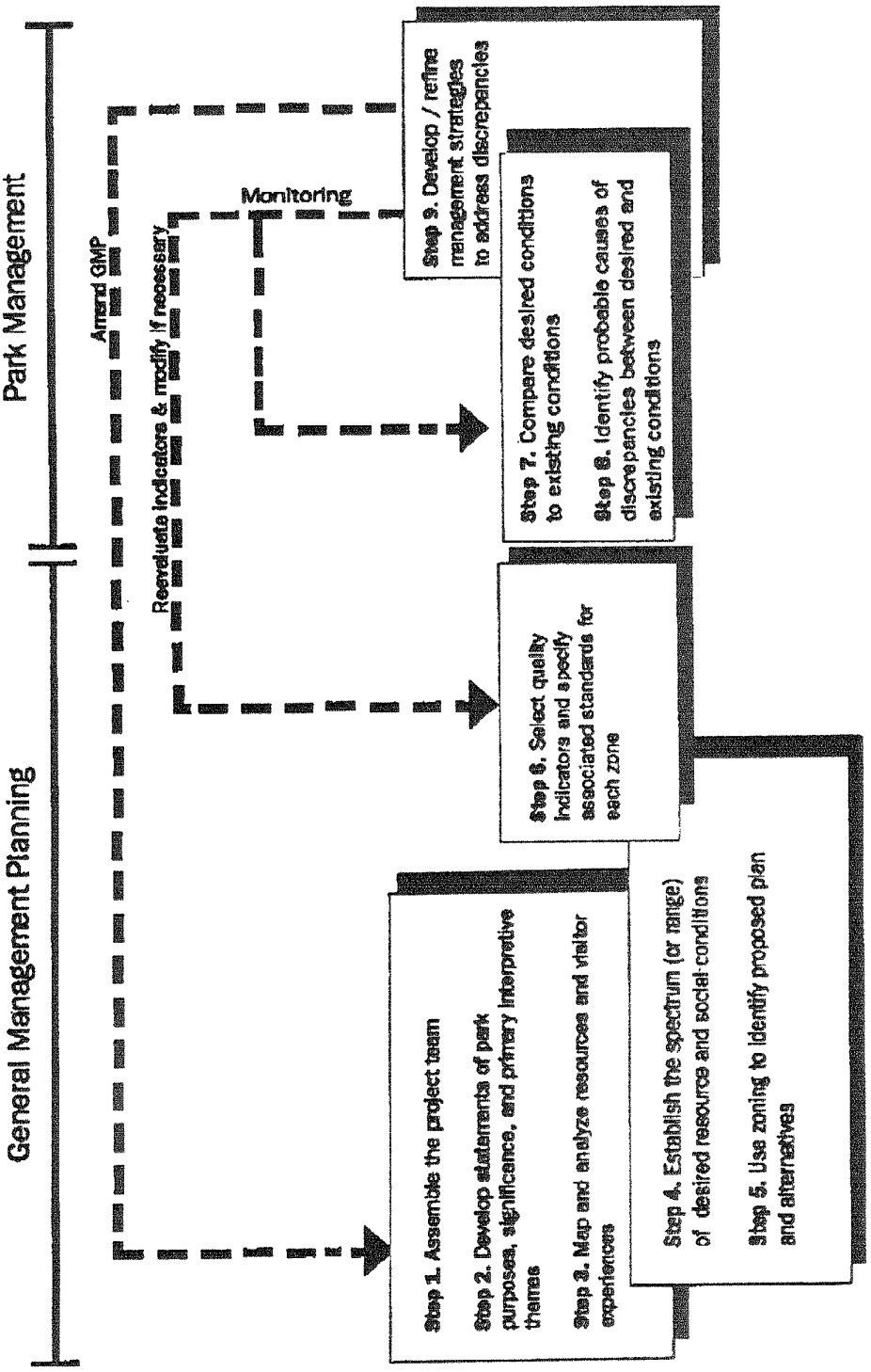


Figure 2. Visitor Experience and Resource Protection (VERP) process.

Responses to the battery of open-ended questions were coded into 91 categories. these categories were then grouped into eight similar subject matter classes or issues: 1) information/education, 2) facilities, 3) crowding, 4) visitor behavior and activities, 5) resource impacts. 6) park management actions, 7) natural features of the park, and 8) miscellaneous. It is apparent that visitors contacted perceive a variety of issues which have some importance in determining the quality of their park experience. Beyond this diversity, however, there is some consensus as well.

Good information, education, and interpretive facilities and services were often cited as contributing to the quality of the visitor experience, but relatively large numbers of visitors expressed a desire for more such programs. Many visitors feel it is important to know about the availability and location of visitor opportunities within the park and to learn more about the significance of park resources. An especially important theme of information and education efforts concerns the importance and knowledge of how to reduce visitor-caused impacts to park resources. For example, the opportunity to interact directly with a ranger through an interpretive program or informal conversation in the park is important to many visitors, and they frequently expressed the need for this activity to be expanded in the park.

Facility-related issues were also cited by many respondents. Many respondents found the hiking trails to their liking and appreciated the extent to which many of the park's major attractions were readily accessible. Visitor attitudes about other activity-related issues were more divided. The primary facility need appears to be more vehicle-accessible campsites. A host of other facilities were suggested by visitors, but each facility was mentioned by only a small minority of visitors. This was offset by a number of visitors who liked the general lack of facilities (or at least, commercial facilities) or felt no additional facilities should be developed in the park.

Many visitors contacted were concerned with crowding-related issues in the park. Twenty percent of respondents felt generally that there were "too many people in the park." Smaller numbers perceived some degree of crowding in selected locations such as parking lots, certain attraction sites, and trails.

Respondents expressed concern about a large variety of inappropriate visitor activities and behaviors. The most important of these behaviors was objection to visitors walking off trails.

Considerable visitor concern was focused on a variety of issues related to the resource impacts of public use. Relatively large numbers of respondents noticed and objected to resource impacts caused by off-trail hiking, graffiti, and litter.

Relatively few visitors included in the sample mentioned issues related to park management activity. The most frequently mentioned issue was that visitors found the park to be well maintained with a lack of visually obtrusive development, and that this contributed to the quality of their experience. For example, an especially positive condition was the general lack of signs and guard rails along park roads which, when present, detract from the visual quality of the setting.

Finally, the most frequently offered comment -- far and away -- was enjoyment and appreciation of the park's natural features, including the arches and the general scenery. While this is not surprising, it suggests that some indicator variable(s) be developed and monitored to ensure this opportunity is not diminished through damage to outstanding natural features or through facility development which detracts from their prominence or appreciation, or through diminished atmospheric visibility.

Responses to close-ended questions also illustrated that there were some widely shared concerns. A majority of respondents rated 14 of the 53 issues as a small or big problem. These 14 issues clustered into five categories:

1. Respondents reported considerable concern over visitors walking off trails and otherwise engaging in behaviors which caused *damage to park resources*.
2. Respondents expressed concern about selected aspects of *crowding* in the park.
3. Respondents expressed some concern over a perceived *lack of rangers* in the park.
4. Respondents expressed concern over two *facility-related issues*: lack of campsites and lack of drinking water.
5. Respondents expressed concern over a perceived *lack of public education programs* in the park.

Findings from the exploratory research in 1992 provided important insights into park conditions and issues which add to or detract from the quality of the visitor experience at Arches National Park. Potential indicators of quality range widely, spanning a variety of broad categories, including:

1. Orientation, information, and interpretive services
2. Visitor facilities
3. Visitor crowding
4. Visitor behavior and activities
5. Resource impacts of visitor use
6. Park management activities
7. Quality and condition of natural features

Phase II of the research program was conducted in 1993. The primary objectives of this phase of the research were to determine the relative importance of indicator variables and to set standards of quality for each indicator variable. A survey of park visitors was conducted in the summer and fall of 1993 at several locations throughout the park. The survey was administered to a representative sample of park visitors and was conducted by means of personal interviews and mail-back questionnaires.

The survey instruments contained two major sections related to carrying capacity. The first section focused on determining the relative importance of indicator variables identified in Phase I research. Fourteen indicator variables were distilled from the previous phase of research and respondents were asked to rate the importance of each variable in determining the quality of their experience at the particular location in the park where they were interviewed. This section of the questionnaire was needed for two reasons. First, Phase I research was qualitative in nature; its purpose was simply to explore for potential indicator variables. Phase II research was needed to become more quantitative by asking respondents to rate the relative importance of these potential indicators of quality. This required a larger and more representative sample. Second, it was hypothesized that indicator variables might vary by location within the park. Sampling was conducted at several areas within the park and questions were keyed directly at those specific areas. This would allow for a zoning approach to carrying capacity determination and management which was felt to be appropriate to a relatively large area such as a national park.

The second major section of the survey questionnaires was directed at determining standards of quality for selected indicator variables. Three indicator variables received special attention: 1) the number of people at one time at major attraction sites within the park, 2) the number of people at one time along major trails, and 3) the amount of environmental impact caused to soil and vegetation by off-trail hiking. All three of these variables were addressed by a series of photographs with illustrated a range of impact conditions. Photographs were developed using a computer-based image capture technology (Pitt 1990; Lime 1990; Nassauer 1990; Chenoweth 1990). Base photographs of park sites were taken, and these images were then modified to present a range of impact conditions. A set of sixteen photographs was developed for each attraction site and trail presenting a wide-ranging number of visitors present. An analogous set of five photographs was developed for a range of environmental impacts caused by off-trail hiking. Respondents rated the acceptability of each photograph. Representative photographs are shown in Figure 3.

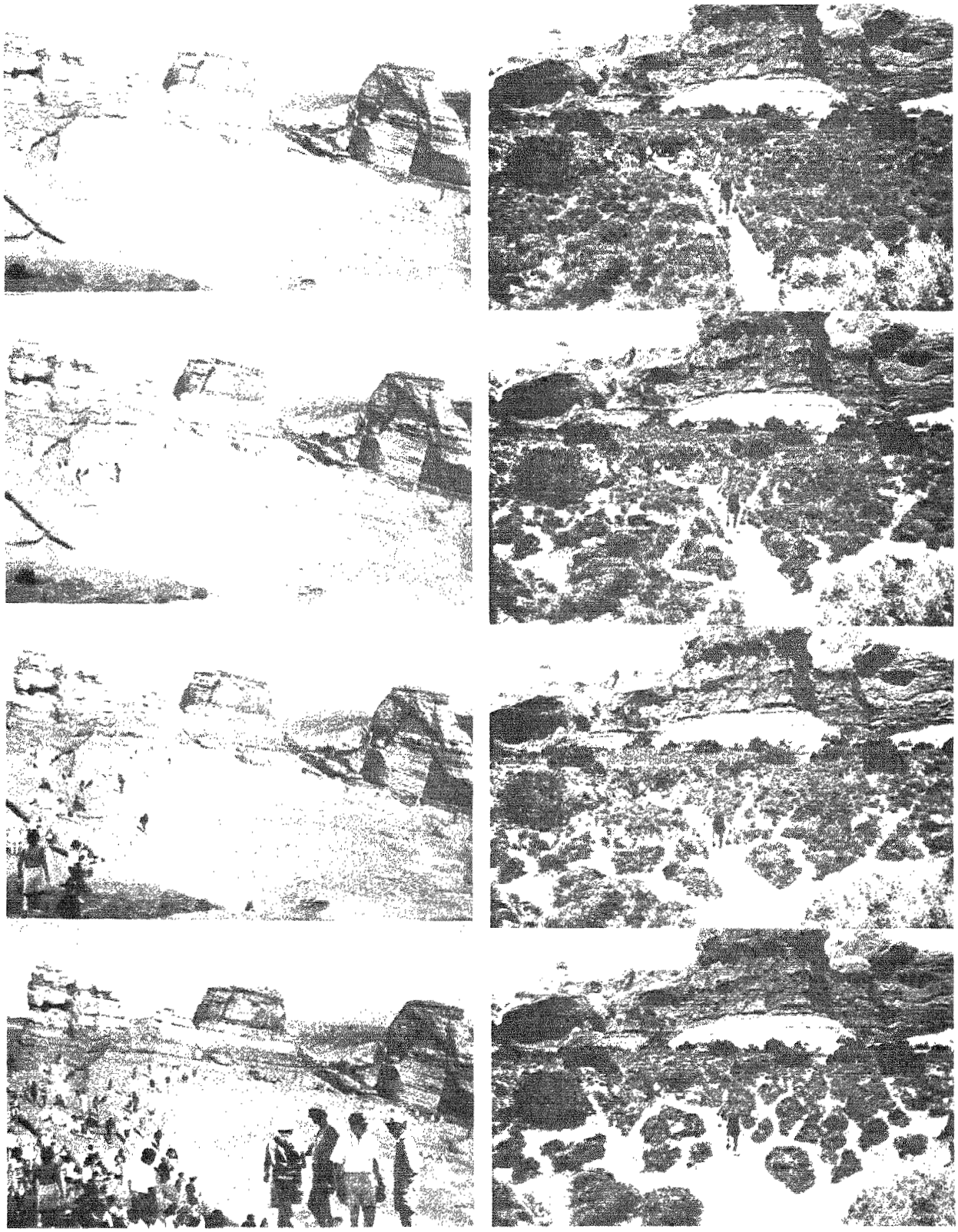


Figure 3. Representative photographs showing a) increasing levels of visitor use, and b) increasing levels of environmental impact.

Data from the second phase of the research program are now being analyzed. Standards-related data appear particularly promising. Figures 4 and 5 are illustrative. These graphs show the acceptability ratings of two of the sets of photographs described above. Figure 4 shows data for the number of people at one time at North Window, a major attraction site in the park. It is clear from the data that acceptability falls into the negative range between the photographs depicting 16 and 24 people. A regressed line plotted to these data crosses the "zero point" or "neutral line" at 20 people at one time. These findings provide a strong rationale for setting a standard of 20 people at one time at North Window.

Figure 5 shows data for the amount of environmental impact along trails at North Window. It is clear from the data that visitors are especially sensitive to this indicator variable. Only the first photograph in the series depicting the trail with no ancillary environmental impact or "social trailing" is judged acceptable. All other levels of environmentally impact are judged unacceptable. These findings provide a strong rationale for setting a standard of no social trailing at North Window.

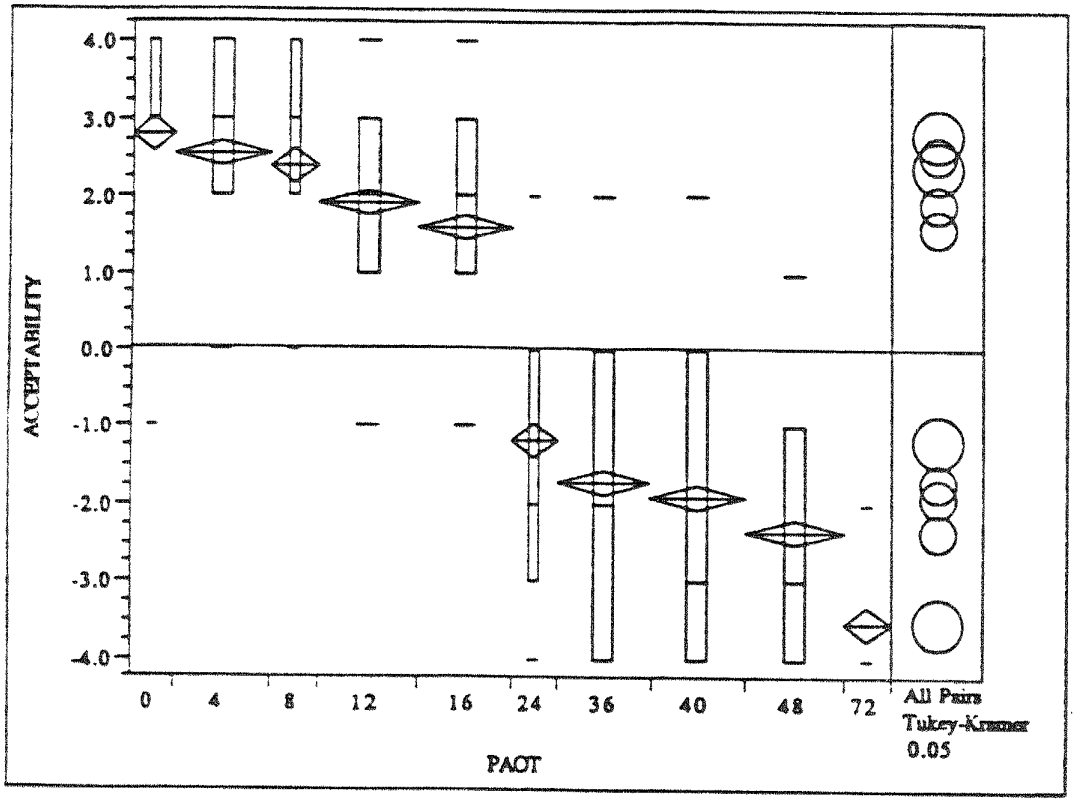


Figure 4. Normative standards for acceptability of the number of people at one time at North Window.

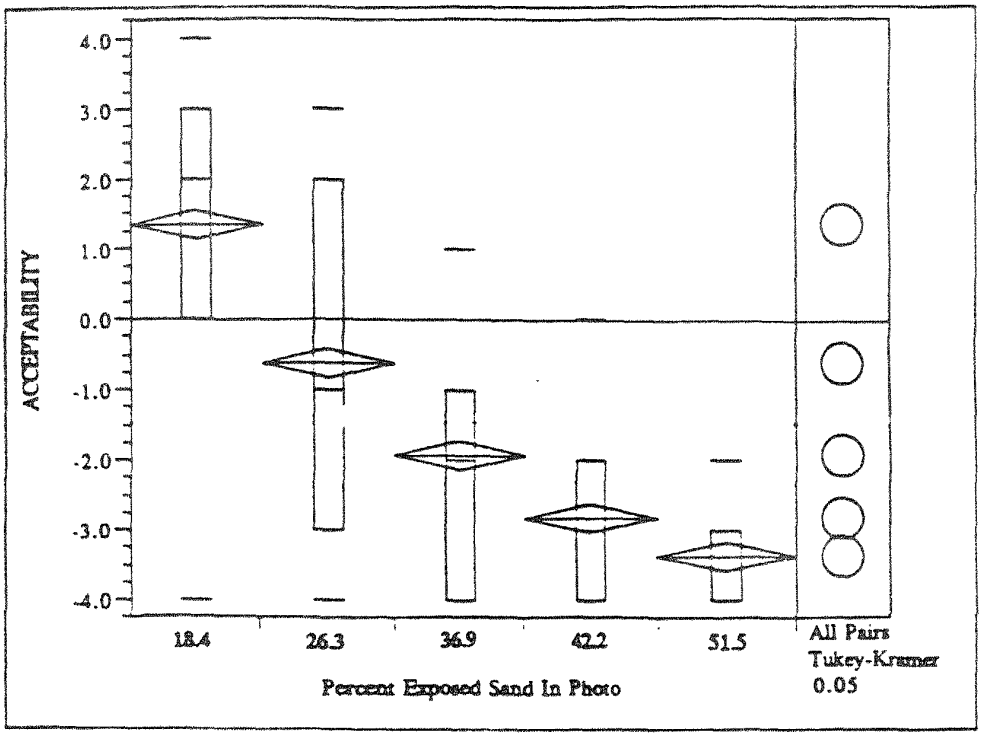


Figure 5. Normative standards for acceptability of environmental impact along trails at North Window.

Conclusion

The VERP program currently being developed by the NPS is designed to provide a theoretically sound basis for establishing and managing the carrying capacity of national parks and similar areas. The program focuses on identification of indicators and standards of the quality of the visitor experience. A monitoring program can then be established to determine whether or not standards, and thus carrying capacity, are being violated.

This program is now being applied at Arches National Park. A program of research has been conducted to identify indicators of the quality of the visitor experience and help set standards for these indicator variables. A variety of management actions will ultimately be initiated to manage the park within its defined carrying capacity. These actions might include the design capacity of attraction site parking lots and a trail/backcountry permit system. A monitoring program will be designed focused on indicator variables and will trigger management action if standards of quality are violated.

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Wildlife and Fisheries Management



MONETARY AND SOCIAL IMPACT MEASURES OF VISITOR EXPERIENCE AND THE EFFECTS OF A PIPING PLOVER RECOVERY PROGRAM ON VISITOR EXPERIENCE

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This study examined visitor perceptions and attitudes towards their experience at a national wildlife refuge which limits access to its barrier beach during the nesting season of the threatened piping plover. It determined attitudes towards the closure, as well as what factors influenced these attitudes. It also examined how willingness to pay for refuge protection related to overall experience rating and attitudes towards wildlife protection and crowding. The data were gathered in 1993 in a self-administered user survey. The results indicate visitor support for the refuge and the beach closure, with those visitors interested in beach-related activities more likely to indicate less positive experiences and less support for the beach closure. A positive relationship was established between willingness to pay for refuge protection and a positive experience, as well as between willingness to pay and support for wildlife protection efforts and limiting the number of visitors.

Introduction

Parker River National Wildlife Refuge was designed to protect a species listed as threatened under the federal Endangered Species Act. The refuge beach was closed to all human recreational use for the past three years during the nesting season of the piping plover, lasting from April through July, to protect the shorebirds while they nested and reared their young. Since the refuge beach is a popular recreation destination during the spring and summer months, the closure has affected a number of refuge visitors. To analyze visitor satisfaction with the refuge experience, and the effect of the beach closure on visitor experience, this study analyzed visitor attitudes regarding their experience at the refuge, the value they place on the refuge as a recreational and natural resource, and how plover protection efforts affect these attitudes and values. It also examined how monetary measures of value related to perceptions of crowding and wildlife protection efforts, and whether experience ratings were related to willingness to pay into a refuge protection fund.

Although the same measures of visitor experience were not used in previous studies, studies conducted at beaches have shown that previous experience with a resource, knowledge of preservation issues , the visual landscape, and convenience all influence willingness to pay into coastal beach protection funds (Bell and Leeworthy, 1986; Lindsay et al. 1992). Perceptions of crowding and parking availability did not influence willingness to pay for resident Florida beach users, but tourists were willing to pay more for beach protection if they perceived increased crowding (Bell and Leeworthy, 1986). McConnell (1976) found that there was a relationship between number of people per acre of beach and willingness to pay for beach use, controlling for temperature, frequency of use, and income. Cicchetti and Smith (1976) also found a relationship between number of campsite and trail contacts and reduced willingness to pay levels.

Background

Parker River National Wildlife Refuge (Parker River, or The Refuge) is located on the southern two-thirds of Plum Island, located off Newburyport, Massachusetts, a coastal community approximately 60 miles north of Boston. The 4,462 acre refuge contains over six miles of undisturbed barrier beach and dunes, constructed dikes and lagoons for waterfowl resting areas, nature trails, observation towers, boardwalks, and a partially paved access road which runs the length of the refuge.

Currently, approximately 250,000 parties visit the refuge annually. The refuge serves as a popular recreation destination for beachgoers, bird watchers, wildlife and nature enthusiasts, environmental education classes, photographers, runners, bicyclists, and walkers. Clamming, waterfowl and deer hunting, berry picking and surf fishing are also active recreation activities which are permitted at various times of the year. This mix of activities has led to a wide variety of restrictions and active management strategies designed to mitigate the potentially adverse affects of human recreation on wildlife and wildlife habitat, and to minimize conflicts between different uses.

Methods

A visitor survey was conducted at the refuge from June through November of 1993. Visitors were given self-administered surveys as they entered the refuge. After pretesting, the survey was conducted between June and November of 1993, including summer months when the beach was open and closed, as well as autumn months. Results of the survey were analyzed using descriptive statistics, cross tabulation and chi-squared analysis, and analysis of variance.

Results

Visitor Experience at the Refuge

Ninety seven percent of respondents indicated that they had an excellent or good experience at the refuge (Table 1) . Overall , they indicated strong support for the beach closure (Table 2), and did not feel that the closure either enhanced or detracted from their experiences (Table 3). Those visitors who came to the refuge to observe wildlife in general or birds in particular were more likely to indicate that the beach closure enhanced their experience (Figure 2), and were also more likely to support the closure (Figure 1). Those visitors who came to fish, walk, or use the beach indicated that the closure detracted from their experience, and were also less likely to support the closure.

Table 1. Visitor rating of overall experience at refuge.

Experience rating	Frequency	Percentage
Poor	4	1%
Fair	22	3%
Good	283	32%
Excellent	577	65%
TOTAL	886	100%

Table 2. Visitor support for beach closure.

	Frequency	Percentage
1= strongly support	554	62%
2	159	18%
3	109	12%
4	27	3%
5= strongly opposed	38	4%
TOTAL	887	100%

Table 3. Effect of beach closure on visitor experience.

	Frequency	Percentage
1= enhanced experience	93	11%
2	57	7%
3	475	57%
4	114	14%
5= detracted from experience	95	11%
TOTAL	834	100%

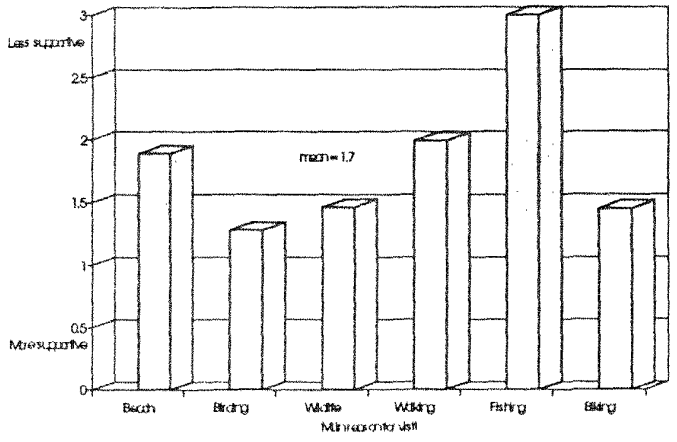


Figure 1. Support for beach closure by reason for visit.

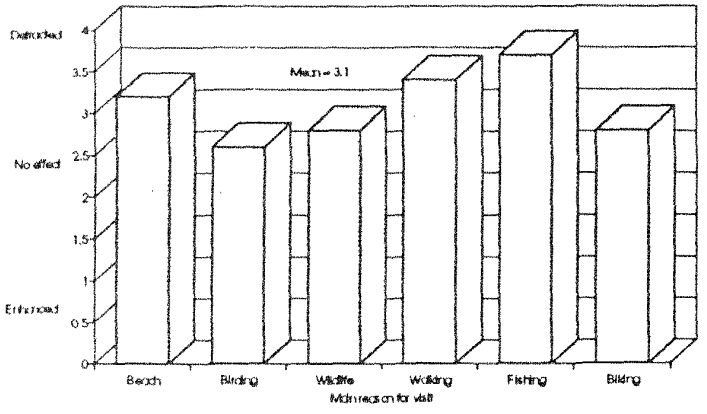


Figure 2. Effect of beach closure by reason for visit.

Specific questions were asked related to issues of crowding and perceptions of wildlife protection issues at the refuge. Visitors indicated slight disagreement with the statement that reducing the number of visitors at the refuge would be desirable, (a mean score of 2.49, with 1 = strongly disagree and 5 = strongly agree) indicating that crowding is not an important issue with the majority of visitors. The majority of visitors felt that wildlife protection measures are adequate at the refuge, or should be emphasized more, with 42 percent neutral and 35 percent agreeing or strongly agreeing with the statement "More measures should be taken to protect wildlife and wildlife habitat at the refuge." Respondents also indicated that they did not feel measures to protect wildlife were overemphasized at the expense of recreation, with 72 percent indicating disagreement or strong disagreement with the statement "Wildlife protection has been overemphasized at the expense of recreation at the refuge." These responses indicated support for the mandate under which the refuge is managed, and are consistent with the support visitors indicated for current refuge management efforts. Given the fact that the most common reasons cited for visiting the refuge

involve recreation and wildlife observation, the support for existing protection efforts and the lack of perceived conflict between protection efforts and recreation indicate that visitors' experiences are not adversely affected by contact with other visitors, or by other uses of the refuge.

Monetary and Social Impact Measures of Visitor Experience
How visitors rated their experiences at the refuge was also assessed through determining the amount they were willing to pay into a fund dedicated to refuge protection. Of the 716 respondents answering the question, the average response was an annual contribution of $24.44 per party.

To determine whether there was a relationship between monetary measures of the visitors' experiences and the social impact measures, one-way ANOVA tests were conducted. There is a significant and positive relationship between willingness to pay for refuge protection and positive experiences at the refuge: those who rate their experience highly are more likely to indicate greater amounts they are willing to pay for refuge protection efforts (Table 4). There is a positive and significant relationship between willingness to pay for refuge protection and support for existing or increased levels of wildlife protection measures at the refuge; those who value the wildlife protection measures at the refuge are willing to pay greater amounts towards further protection of the refuge than are those who do not place as much importance on wildlife protection (Table 6). There is also a positive and significant relationship between willingness to pay for refuge protection and support for reducing the number of visitors at the refuge (Table 7). Although more visitors disagree with the statement that the number of visitors should be reduced, those who do agree are willing to pay more for refuge protection.

Effects of the Beach Closure
Those visitors who rated their experience less highly were more likely to be visiting during the beach closure months (table 8). Support for the closure was not, however, influenced by when the visit took place. No statistically significant difference was noted between willingness to pay for refuge protection when the beach was open and when the beach was closed. The beach closure variable does not add explanatory power to the relationship between willingness to pay for refuge protection and visitor satisfaction expressed through experience rating; the relationship is not significantly affected by whether the beach is open or closed. Similarly, the beach closure variable does not change the significant and positive relationships between willingness to pay for refuge protection and beliefs regarding the importance of wildlife protection efforts and the desirability of reduced numbers of visitors.

Table 4. Relationship between rating of overall experience and willingness to pay for refuge protection.

How would you rate your experience at the refuge?	Mean willingness to pay for refuge protection	Frequency
Poor	$10.00	4
Fair	$19.00	15
Good	$22.39	218
Excellent	$25.17	466
TOTAL		703

a/ F statistic = 3.04*
Bartlett's test for equal variances:
$chi^2(3) = 0.7864$ Prob>$chi^2 = 0.853$
* = Significant at the .05 level

Table 5. Relationship between response to "Wildlife protection has been overemphasized at the expense of recreation" and willingness to pay for refuge protection.

	Mean willingness to pay for refuge protection	Frequency
1 = strongly agree	$20.16	32
2	$23.77	53
3	$23.42	98
4	$22.98	155
5 = strongly disagree	$25.26	351
TOTAL		689

a/ F statistic = 1.17*
Bartlett's test for equal variances: $chi^2(4) = 1.9175$
Prob>$chi^2 = 0.751$ * = Significant at the .05 level

Table 6. Relationship between response to "More measures should be taken to protect wildlife" and willingness to pay for refuge protection.

	Mean willingness to pay for refuge protection	Frequency
1 = strongly disagree	$19.08	49
2	$21.18	106
3	$24.27	291
4	$26.49	109
5 = strongly agree	$25.11	130
TOTAL		685

a/ F statistic = 2.80*
Bartlett's test for equal variances: $chi^2(4) = 3.8031$
Prob>$chi^2 = 0.433$ * = Significant at the .05 level

Table 7. Relationship between response to "Reduce number of visitors" and willingness to pay for refuge protection.

	Mean willingness to pay for refuge protection	Frequency
1= strongly disagree	$21.39	140
2	$22.44	210
3	$25.25	249
4	$27.62	60
5= strongly agree	$30.86	29
TOTAL		688

a/ F statistic = 3.94*
Bartlett's test for equal variances: $chi^2(4) = 3.6845$
Prob>$chi^2 = 0.450$ * = Significant at the .01 level

Table 8. Relationship between rating of overall experience and time of year.

	Experience: Poor	Fair	Good	Excellent	TOTAL
Beach closed	3	10	82	153	248
Percent	*75%*	*46%*	*29%*	*27%*	*28%*
Beach open	1	12	201	424	638
Percent	*25%*	*55%*	*71%*	*74%*	*72%*
TOTAL	4	22	283	577	886
Percent	*100%*	*100%*	*100%*	*100%*	*100%*

a/ Pearson $chi^2(3) = 8.4727$
Pr= 0.037*
* = significant at the .05 level

Summary

Results of the visitor survey revealed visitors had an overall positive perception of their experience, were supportive of the beach closure, and the majority felt that it neither enhanced nor detracted from their experience. Willingness to pay into a fund dedicated to refuge protection was positively related to positive perceptions of experience. When the visitors were attending the refuge (during the beach closure or when the beach was accessible) did affect visitor experience ratings, but did not affect support for the closure. Those most inconvenienced, including beach users and fishermen, were most likely to feel the closure detracted from their experience, while wildlife observers felt it enhanced their visit. The beach closure did not have a significant affect on willingness to pay for protection. Willingness to pay is also related to support for current or increased wildlife protection efforts at the refuge, and to decreasing use levels at the refuge.

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ANGLER SPECIALIZATION AMONG SALMON AND TROUT ANGLERS ON LAKE ONTARIO

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The angler specialization concept was studied using the expectancy model of motivation. An exploratory study of Lake Ontario salmon and trout anglers was conducted to test the relationships between the variables of the expectancy model of motivation and actual angling participation.

Introduction

The angling specialization concept was proposed by Bryan (1977, 1979) to explain the formation of motives and the general process of motivational change that leads an angler to seek different species, settings, equipment, and experiences. The hierarchical progression of angler social development proposed by Bryan (1977, 1979) suggested that anglers could be categorized into four types: (1) occasional angler, (2) generalist angler, (3) tackle-species specialist, and (4) method-species-setting specialist. These angler types were based on angler equipment, target species, and fishing activities (e.g., dry fly trout angler) and tended to define the motivational context by association with the angling activity and equipment. The concept of angling specialization has been further explored by fisheries researchers interested in social interactions, angling motivations, and social implications for fishery management (Steele et al., 1990; Hahn, 1991; Ditton et al., 1992; Dawson et al., 1992a and 1992b).

One of the alternate motivational approaches to studying angler specialization is the expectancy theory (Dawson et al., 1992a). Expectancy theory provides an operational research approach to studying angler specialization and a comprehensive framework to assist managers in understanding the management implications of the findings. The expectancy model of motivation (Figure 1) used in this study is based on the work of Vroom (1964) and others (Hanner et al., 1983; Landy and Trumbo, 1983; Nadler and Lawler, 1983). The three variables of this theory are:
(1) Expectancy -- the relative probability that an individual ascribes to his/her ability to perform a task successfully;
(2) Instrumentality -- the relative probability that an individual ascribes to his/her ability to attain the desired outcome; and
(3) Valence -- the relative value that an individual places on the expected outcome.

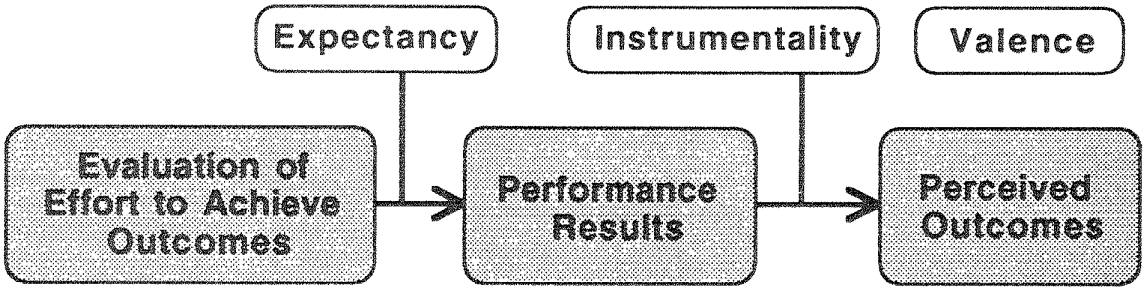


Figure 1. Expectancy model of motivation.

Methods

An exploratory study was conducted on Lake Ontario salmon and trout boat anglers to evaluate the angler specialization concept for the method-species-setting specialist category and test the relationships between the three variables of the expectancy model of motivation for specialized fishing activities. A sample of anglers was selected from respondents to a previous (1989) statewide survey of anglers who reported fishing in Lake Ontario during 1988 (Connelly et al., 1990). A random sample of 396 anglers was selected and sent a mail survey in 1992. Fifty-five surveys were undeliverable due to address changes by anglers. After two reminders, 190 anglers responded (56% response) of the 341 surveys deliverable.

Information collected on the mail survey included angling participation in Lake Ontario during 1991 for salmon and trout, fishing equipment and techniques used, and measures of angler expectancy, instrumentality, and valence. Salmon/trout angler expectancy was a self-reported rating of the individual's fishing skill or competence with a specific fishing technique for a specific species using a five point scale of: (0.00) Not competent, (0.25) Somewhat competent, (0.50) Competent, (0.75) Very competent, and (1.00) Extremely competent. Salmon/trout angler instrumentality was a self-reported rating of the individual's probability of catching one or more fish with given a fishing technique for a specific species using a five point scale of: (0.00) Not probable, (0.25) Somewhat probable, (0.50) Probable, (0.75) Very probable, and (1.00) Extremely probable. Salmon/trout angler valence was self-reported participation in fishing on Lake Ontario during the years 1989 through 1992 (i.e., the number of years fished) for a specific species (i.e., Chinook & Coho salmon, Steelhead, Brown trout, and Lake trout); this assumes that the time and resources invested in participation is an index for the relative value of the outcome.

Anglers use different fishing techniques and equipment for different species depending on the season, fish location and depth, fish feeding habits and preferences, and angler equipment and ability. All anglers in the study fished Lake Ontario from a boat (i.e., the setting was similar for all anglers surveyed).

The first goal of this study was to investigate the three general variables in the expectancy model: expectancy, instrumentality, and valence. The statistical hypotheses examined were:
(1) Expectancy (technique competence) variables between species or between techniques were not associated; (2) Instrumentality (probability of catching fish) variables between species or between techniques were not associated; and (3) Valence (days of participation) variables between species or between techniques were not associated. The second goal was to investigate the relationship between the expectancy motivation scale score and actual participation for 1991 angling on Lake Ontario (the most recent year with complete annual participation information).

Results

Angler expectancy or fishing skill and competency ratings for each technique and species (Table 1) suggest that the average angler is reportedly competent in the use of downriggers and flatlining but somewhat less competent with planer boards. A high degree of variability in competency ratings was reported between anglers for each species and technique. The statistical hypotheses that these expectancy variables between species and techniques were not associated was rejected since the correlations between all 12 variables were statistically significant ($p<.001$) (Table 2).

Table 1. Mean reported fishing technique skill or competence (expectancy) ratings and standard deviations for each technique and species.

	Mean (rating)	Standard Deviation
Downriggers		
Salmon	.46	.29
Steelhead	.41	.30
Brown Trout	.43	.29
Lake Trout	.50	.32
Planer Boards		
Salmon	.27	.27
Steelhead	.28	.30
Brown Trout	.31	.31
Lake Trout	.26	.27
Flatlining		
Salmon	.44	.30
Steelhead	.41	.31
Brown Trout	.46	.31
Lake Trout	.41	.30

The self-reported angler instrumentality or probability of catching fish ratings for each technique and species (Table 3) suggest that the average angler considers it very probable that they can catch one or more fish with downriggers but somewhat less probable with planer boards and flatlining. A high degree of variability in instrumentality ratings was reported between anglers for each species and technique. The statistical hypotheses that these instrumentality variables between species and techniques were not associated was rejected since the correlations between the majority of all 12 variables were statistically significant ($p<.001$) (Table 4).

The average number of years (valence) that anglers have returned to fish for each species on Lake Ontario, since they were first contacted in 1988, suggests that the average angler more highly values salmon as a target species more than the other three trout species (Table 5). A high degree of variability in valence ratings was reported between anglers for each species. The statistical hypotheses that these valence variables between species were not associated was rejected since all of the correlations between the four variables were statistically significant ($p<.001$) (Table 5).

Table 2. Correlation coefficients for reported fishing technique skill or competence (expectancy) compared between technique and species (2-tailed significance test, and $p< .001$ for all correlations).

	Downriggers				Planer Boards				Flatlining			
	Salmon	Steel-head	Brown Trout	Lake Trout	Salmon	Steel-head	Brown Trout	Lake Trout	Salmon	Steel-head	Brown Trout	Lake Trout
Downriggers												
Salmon	1.00											
Steelhead	.85	1.00										
Brown Trout	.84	.79	1.00									
Lake Trout	.88	.76	.80	1.00								
Planer Boards												
Salmon	.62	.60	.52	.55	1.00							
Steelhead	.64	.70	.55	.57	.87	1.00						
Brown Trout	.62	.60	.62	.61	.84	.85	1.00					
Lake Trout	.54	.51	.51	.54	.82	.74	.77	1.00				
Flatlining												
Salmon	.55	.57	.51	.47	.46	.41	.37	.37	1.00			
Steelhead	.53	.67	.51	.44	.50	.57	.42	.44	.86	1.00		
Brown Trout	.58	56	.64	.52	.42	.46	.53	.41	.80	.75	1.00	
Lake Trout	.44	.45	.45	.44	.37	.30	.30	.47	.82	.78	.72	1.00

Table 3. Mean reported probability for catching fish (instrumentality) ratings and standard deviations for each technique and species.

	Mean (rating)	Standard Deviation
Downriggers		
Salmon	.61	.29
Steelhead	.51	.30
Brown Trout	.55	.29
Lake Trout	.66	.30
Planer Boards		
Salmon	.34	.28
Steelhead	.38	.32
Brown Trout	.43	.33
Lake Trout	.34	.29
Flatlining		
Salmon	.38	.28
Steelhead	.40	.28
Brown Trout	.48	.30
Lake Trout	.38	.28

Table 4. Correlation coefficients for reported probability for catching fish (instrumentality) with a given technique compared between technique and species (2-tailed significance test, and p< .001 for all correlations greater than .26).

	Downriggers				Planer Boards				Flatlining			
	Salmon	Steel-head	Brown Trout	Lake Trout	Salmon	Steel-head	Brown Trout	Lake Trout	Salmon	Steel-head	Brown Trout	Lake Trout
Downriggers												
Salmon	1.00											
Steelhead	.77	1.00										
Brown Trout	.60	.60	1.00									
Lake Trout	.69	.62	.74	1.00								
Planer Boards												
Salmon	.47	.53	.34	.32	1.00							
Steelhead	.51	.65	.42	.45	.73	1.00						
Brown Trout	.45	.46	.59	.55	.54	.66	1.00					
Lake Trout	.19	.23	.35	.35	.57	.56	.58	1.00				
Flatlining												
Salmon	.38	.42	.21	.21	.57	.43	.26	.23	1.00			
Steelhead	.39	.47	.22	.29	.53	.63	.39	.39	.66	1.00		
Brown Trout	.32	27	.46	.40	.24	.40	.64	.40	.40	.54	1.00	
Lake Trout	.11	.10	.24	.20	.26	.24	.20	.57	.47	.44	.52	1.00

Table 5. Mean number of years fishing for the target species (valence) and correlation coefficients for participation in fishing on Lake Ontario during the years 1989 through 1992 compared between species (2-tailed significance test, and p< .001 for all correlations).

		Correlation Coefficients			
Species	Mean (years of angling)	Salmon	Steel-head	Brown Trout	Lake Trout
Salmon	1.9	1.00			
Steelhead	1.3	.61	1.00		
Brown Trout	1.5	.54	.61	1.00	
Lake Trout	1.4	.45	.44	.66	1.00

The number of days that anglers have fished for each species using the three techniques on Lake Ontario suggests that the average angler prefers salmon as a target species more than the other three trout species (Table 6). A high degree of variability in participation was reported between anglers for each species and technique. The statistical hypotheses that these participation variables between species and techniques were not associated was rejected because the majority of the correlations between the 12 variables were statistically significant (p<.001) (Table 7).

The scale scores for motivation using the expectancy theory were calculated, on a case-by-case basis, by the formula that motivation = expectancy x instrumentality x valence. The highest scale scores were for salmon and lake trout fishing using downriggers (Table 8). The calculated scores range from 0 to 1 and had a high degree of variability. To test these motivation scale scores, they were compared with the participation variables for 1991 on Lake Ontario to determine if there was any correlation between motivation and actual angling participation.

the correlations between the motivation scale scores and actual participation were not as high as anticipated; ranging from .21 to .70 (Table 8). Stronger correlations were observed between the valence variable and actual participation (i.e., a one-variable comparison with participation and not the three-variable scale score that includes valence); ranging from .43 to .77 (Table 8). However, the correlation between valence and actual participation in 1991 also raises questions about the use of this variable (i.e., number of years fished) to represent valence in this study.

Discussion

The specialization concept suggests that method-species-setting specialists would tend to focus on specific target species and fishing techniques. This study attempted to hold the setting relatively constant by choosing Lake Ontario boating anglers who use three distinct angling methods and target four species of fish. Previous studies indicated that Lake Ontario anglers use different fishing techniques and equipment for different species depending on the season, fish location and depth, fish feeding habits and preferences, and angler equipment and ability. The anticipated results from this study were that: (1) distinct groups of anglers would be categorized by angling techniques used and target species sought (i.e., associations between the 12 species and fishing technique combinations would not be evident); and (2) the motivational scale score calculated by the expectancy theory approach would be highly correlated with actual participation (i.e., associations between motivational scale scores and actual participation for the 12 species and fishing technique combinations would be evident). Such results were not found in the statistical results presented herein nor in additional cluster and factor analysis study results conducted but not presented here.

Table 6. Mean reported number of days fishing on Lake Ontario during 1991 and standard deviations for each technique and species.

	Mean (days of angling)	Standard Deviation
Downriggers		
Salmon	4.6	12.2
Steelhead	2.5	7.1
Brown Trout	2.2	6.1
Lake Trout	3.1	9.6
Planer Boards		
Salmon	0.4	2.0
Steelhead	0.9	3.7
Brown Trout	1.6	10.0
Lake Trout	0.1	0.7
Flatlining		
Salmon	0.6	2.0
Steelhead	0.7	2.7
Brown Trout	0.7	2.3
Lake Trout	0.3	1.0

Table 7. Correlation coefficients for reported number of days of fishing on Lake Ontario during 1991 compared between technique and species (2-tailed significance test, and p< .001 for all correlations greater than .25).

	Downriggers				Planer Boards				Flatlining			
	Salmon	Steel-head	Brown Trout	Lake Trout	Salmon	Steel-head	Brown Trout	Lake Trout	Salmon	Steel-head	Brown Trout	Lake Trout
Downriggers												
Salmon	1.00											
Steelhead	.72	1.00										
Brown Trout	.68	.82	1.00									
Lake Trout	.75	.80	78	1.00								
Planer Boards												
Salmon	.44	.44	.37	.37	1.00							
Steelhead	.57	.42	.39	.40	.77	1.00						
Brown Trout	.41	.25	.15	.18	.89	.82	1.00					
Lake Trout	17	.28	.21	.25	.19	.21	.09	1.00				
Flatlining												
Salmon	.25	.26	.30	.37	.16	.23	.07	.07	1.00			
Steelhead	.56	.46	.50	.51	.79	.76	.72	.06	.35	1.00		
Brown Trout	.32	28	.37	.32	.18	.19	.11	.08	.23	.40	1.00	
Lake Trout	.13	.10	.06	.23	.01	.02	.01	.24	.58	.14	.26	1.00

Possibly a more extreme comparison between salmon/trout (e.g., cold-water fishery) and bass anglers (e.g., warm-water fishery) on Lake Ontario would have produced results that fit better with the general fishing specialization concept. However, additional variables on angler preferences and substitution for target species, angler preferences and substitution for fishing techniques, abundance and availability of target species, and others may be important to understanding the limits of the fishing specialization concept versus more opportunistic angler behavior.

The statistical correlations found in this study between the 12 target species and fishing technique variables for expectancy, instrumentality, valence, and actual participation suggest that the specialization concept is more complex and multidimensional than indicated by earlier researchers. For example, some anglers on Lake Ontario may be more specialized on fishing techniques than species and more opportunistic in that they will target whatever species of trout and salmon that is susceptible to the fishing techniques they are more competent with in that area and season. Such possibilities do not fit easily within the current fishing specialization concept as presented by Bryan (1977) and will require the development of more complex models of angler behavior, decision-making, and motivation, and the use of multivariate statistical analysis for empirical testing of such theories and hypotheses.

This exploratory study has shown the difficulties inherent in operationalizing a model of angler behavior using the expectancy theory. Determining an appropriate valence variable (i.e., the relative value that anglers place on the expected outcome of successfully catching the target species) was problematic and the one employed in this study (i.e., number of years of fishing with the techniques for the target species) was highly correlated with actual days of fishing participation in 1991 on Lake Ontario. Conversely, the motivational scale score derived from this expectancy model was not highly correlated with actual fishing participation in 1991 on Lake Ontario for salmon/trout boat-based anglers.

Table 8. Mean expectancy scale scores (score = expectancy x instrumentality x valence) and standard deviations and scale score correlations with participation and valence variables (2-tailed significance test, and p< .001 for all correlations greater than .30) for each technique and species.

	Mean Expectancy Scale Score	Standard Deviation of the Expectancy Scale Score	Scale Score Correlation with Actual Participation	Valence Correlation with Actual Participation
Downriggers				
Salmon	.81	.98	.44	.66
Steelhead	.52	.92	.60	.74
Brown Trout	.54	.83	.35	.70
Lake Trout	71	1.00	.38	.77
Planer Boards				
Salmon	.30	.49	.32	.43
Steelhead	.38	.81	.69	.60
Brown Trout	.41	.80	.35	.61
Lake Trout	.26	.60	.70	.51
Flatlining				
Salmon	.43	.67	.21	.51
Steelhead	.40	.78	.27	.68
Brown Trout	.52	.89	.40	.69
Lake Trout	.36	.73	.38	.60

Some of the concepts reported in the literature on angler progression through sequential and hierarchical stages of fishing specialization appear intuitively pleasing and are part of the current concepts in fisheries management; however, empirical evidence to support or alter such concepts is more difficult to obtain. At present, research on models of angler or any recreational behavior and decision-making is fragmented and not integrated or comprehensive. The challenge for the future is to develop empirically based models of angling behavior and decision-making that can describe angler behavior patterns, predict angler behavior under varying circumstances, and suggest how fishery managers can influence angler behavior.

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EFFECT OF EXPERIENCE, EXPECTATION AND RESOURCE AVAILABILITY ON PERCEPTIONS OF CROWDING AMONG TROUT ANGLERS IN PENNSYLVANIA.

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Crowding research has suggested expectancy theory as one explanation to perceptions of crowding expressed by participants in outdoor recreation activities. Expectancy theory states that an individual enters into an activity with a preconceived set of expectations for the outcome of the experience. In this study, anglers fishing on the opening day of Pennsylvania's trout season were surveyed in an effort to determine if level of expected contacts influenced perceptions of crowding. Anglers were assigned to one of two groups, those with prior experience fishing the site on opening day and those new to the site for opening day. Mann-Whitney tests for two independent samples suggests prior experience does not play a role in explaining anglers' perceptions of crowding. A discussion of the importance of the temporal and situational dimensions of crowding research is also provided.

Introduction

Crowding has been one of the most frequently studied phenomena in outdoor recreation research (Manning 1985; Shelby et al. 1989). The psychological dimensions of crowding have been examined from the theoretical perspectives of expectancy (Shelby et al. 1983), discrepancy (Schreyer and Roggenbuck 1978) and normative behaviors (Gramann 1982). Schreyer and Roggenbuck (1978) proposed crowding research be conducted under the psychological domain of expectancy theory. Expectancy theory, as related to outdoor recreation by Schreyer and Roggenbuck, states that the recreationist has a predetermined set of expectations for an outdoor experience. Included in this set of expectations is the expected level of encounters with others while participating in the chosen activity. Crowding is then perceived to occur if the level of contacts experienced exceeds that which was expected.

The application of expectancy theory has been instrumental in separating crowding from reflections of density. Schreyer and Roggenbuck (1978) found expectations to be a significant factor in the subjective assessment of crowding by river floaters. In their study, expectations for the outcomes of the experience were examined concurrently with expectations for contact with others. Where the actual contacts exceed those expected, crowding was stated to occur. The level of perceived crowding differed by motivations and experience outcomes. Absher and Lee (1981) found experience motives to be a stronger predictor of crowding perceptions than actual density levels. Those backcountry users desiring solitude and shared experience with others in their group expressed the highest perceptions of crowding when contacts with others exceeded their level of expectation.

High levels of density may occur in an outdoor recreation setting, but the conditions may not necessarily be perceived as crowded by the participants due to their expectations for contacts. Graefe et al. (1986) found expectations for contact to be an indicator of perceived crowding than encounters with other visitors in backcountry settings, even when expectations for contacts were higher than the participant desired. This acceptance of higher density may be due to past experience with the site, thus providing the visitor with a reference from which to establish a level of expected encounters with others (Vaske et al. 1980; Ditton et al. 1983).

Crowding perceptions may also be influenced by the preferences for the experience expressed by the recreationist. Shelby et al. (1983) reviewed six different studies related to crowding perceptions. While the studies were conducted with different activities, their analysis showed preference variables to be related to crowding perceptions for some activities, although preferences were not as strongly related to crowding perceptions as expectation variables. In some outdoor recreation activities (e.g., deer hunting), preferences may actually be for a higher density than for other activities. In these situations, preference may not be an adequate predictor of crowding.

The influence of social behavior has been effectively associated with perceptions of crowding (Gramann 1982; Manning 1985; Vaske et al. 1986; Williams et al. 1991). Under the theoretical domain of normative behavior, the social psychological aspect of crowding is related not so much to how many people are encountered as to the behavior of those encountered. Normative behavior theory implies that encounters with other recreationists are evaluated on the basis of the behavior exhibited by those encountered. These behaviors are evaluated and compared to a set of standard behaviors by the participant, and if the behaviors expressed by others is found in contrast to those deemed appropriate by the participant the situation may be determined as crowded.

An extensive review of thirty-six studies relating to crowding research was conducted by Shelby et al. (1989). Five hypotheses were proposed for this composite analysis. First, it was proposed that crowding perceptions would vary in a temporal dimension, either by time of use or by season. Second, crowding would be dependent on resource abundance or availability, with different perceptions of crowding expressed by consumptive vs. non-consumptive recreationists. Third, the researchers proposed crowding would differ by the level of access the recreationist felt was provided to the resources. Fourth, crowding was hypothesized to differ by type of use (i.e. consumptive versus nonconsumptive). Fifth, crowding was stated to be related to different management actions for the site.

Results of the review of the research studies by Shelby and others (1989) supported four of the five hypotheses. Only the fourth hypothesis, crowding differed by type of use was rejected as not significant. This review has several suggestions for the current study. First, crowding perceptions may differ by time or season of use. In the present study reported here, anglers fishing on the opening day of the season may report different levels of crowding than those surveyed at another point in the season. Second, the notion that crowding may differ by resource availability is an important point if anglers feel there are more fish available early in the season when stocking has recently occurred. Another aspect related to the present study is the role played by management actions in crowding perceptions. Stocking trout prior to an during the early portion of the trout fishing season is a management action that may influence the crowding perceptions expressed by the anglers involved.

Hypotheses

The present study deals with perceptions of crowding among trout anglers on the opening day of trout season in Pennsylvania. In order to examine the possible perceptions of crowding expressed by the participants in this study, four hypotheses are proposed.

H_1: Perceptions of crowding are not related to past experience at site.

H_2: Perceptions of crowding are not related to environmental conditions.

H_3: Perceptions of crowding are independent of resource availability.

The first hypothesis addresses the application of expectancy theory in crowding research. The second hypothesis seeks to investigate possible interactions between perceptions of resource availability and crowding. The third hypothesis concerns the possible influence group membership may have on perceived crowding, while the fourth hypothesis addresses the theory of normative behavior and perceived crowding.

Methods

This study was originally intended to include three streams: Spring Creek (a no harvest stream), Logan Branch (a limited stocking, wild trout stream) and Bald Eagle Creek (high stocking stream). Heavy rains and flooding prior to the opening day of trout season prevented the use of these streams as study locations. As an alternative to the use of the streams for this study, a local lake was selected under the assumption that the weather would displace anglers from the streams and those wishing to fish on the opening day would seek out local lakes.

Description of Study Site

This study was conducted in Poe Valley State Park in Centre County, Pennsylvania. Located approximately 35 miles east of the town of State College, Poe Valley State Park offers boating and fishing on a thirty-five acre impoundment situated in a small valley on the top of Broad Mountain.

Sample Population

Data for this study were obtained through on-site interviews with anglers fishing at Poe Valley State Park on Pennsylvania's opening day of trout season (April 17, 1993). The opening day is typically one of high angler densities, and suitable for examining the relationship between expectations toward crowding and the realized experience. Each angler participating in the study was approached by the researcher and asked to complete a questionnaire. The survey instrument consisted of eighteen questions. Fourteen of the questions were of an ordinal, Likert-type of response, and four questions were continuous in nature as interval responses. Follow-up studies were attempted for two subsequent weekends, but were unsuccessful due to a low turn out of anglers on the following weekends. As a result of the low angler participation on the weekends following the opening day, data for this study were limited to the responses obtained from the opening day sample.

The purpose of this study was to measure the perception of crowding experienced by the anglers participating in opening day fishing activities. Two measures of crowding were used. The first measure asked the angler if there were more or less people than he or she had expected and used a five-point Likert scale ranging from much less than expected to much more than expected.

The second measure of perceptions of crowding involved the use of the nine-point Likert scale suggested by Vaske et al. (1980). This scale denotes positions one and two as "not crowded" and three through nine as "slightly crowded" to "very crowded," respectively. Anglers were also asked if the number of people present on this day different as "more," "same" or "less" from past years.

In addition to perception of crowding, questions examining the angler's resource orientation, fishing experience and level of participation were also asked. The final question asked for the number of fish that angler had caught thus far.

Results

Data Analysis

A total of 31 completed questionnaires were obtained through the opening day sample. The mean response for expectations of crowding was 3.0 or "about the same as expected," indicating the respondents evaluated the level of contact to meet with their expectations. The mean response for the nine-point crowding scale was crowding was 5.5, indicating the mean response to be interpreted as "crowded." Table 1 provides a summary of the means for selected variables in the questionnaire.

Table 1. Means and standard deviations for crowding variables by angler type.

New Anglers (N = 13)	Mean	St.Dev.
Expected Level of Contacts	3.7	0.78
Perceptions of Conditions	2.7	0.48
Perceptions of Crowding	5.7	2.06
Number of Fish Caught	1.0	0.92
Past Anglers (N = 18)	**Mean**	**St.Dev.**
Expected Level of Contacts	3.5	1.2
Perceptions of Conditions	2.5	0.7
Perceptions of Crowding	5.3	2.33
Number of Fish Caught	4	2.71

The responses were classified by those who had prior experience fishing the lake on opening day of trout season and those who were new visitors to the lake for the opening day. A Mann-Whitney test for two independent samples was conducted to determine if a difference in perceptions of crowding existed between the two groups (Table 2). Based on the results of the Mann-Whitney test, it was determined that no difference in perceptions of crowding exists between the two groups (a = .05), thus hypothesis H1 is not rejected.

Table 2. Mann-Whitney confidence interval and test for perceptions of crowding.

New Anglers	N = 13	Median = 6.000
Past Anglers	N = 18	Median = 5.000

Point estimate for ETA1-ETA2 is -0.000
95.2 pct c.i. for ETA1-ETA2 is (-1.000,2.000)
W = 216.0
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.7640
The test is significant at 0.7615 (adjusted for ties)
Cannot reject at alpha = 0.05

Past experience was used as an independent variable in comparison to perceptions of fishing conditions. A index of fishing conditions was derived from items asking about the quality of the fishing on that day, water conditions, and weather. Past users did not indicate a difference in perceptions of fishing conditions when compared with new anglers. Hypothesis H2, no difference in perceptions of fishing conditions exist between anglers with past experience and anglers with no site experience, cannot be rejected at a = .05. The Mann-Whitney test for independence for perceptions of fishing conditions is presented in Table 3.

Table 3. Mann-Whitney confidence interval and test for perceptions of fishing conditions.

New Anglers	N = 13	Median = 3.0000
Past Anglers	N = 18	Median = 2.0000

Point estimate for ETA1-ETA2 is -0.0000
95.2 pct c.i. for ETA1-ETA2 is (-0.0001,1.0000)
W = 234.5
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.2980
The test is significant at 0.2431 (adjusted for ties)
Cannot reject at alpha = 0.05

The number of fish caught and competition from other anglers were used as indicators of the availability of the resource. New anglers caught significantly less fish than anglers with prior experience at the lake and were no as adept at locating prime locations for fishing. New anglers thus showed a significant difference from anglers with prior experience at the lake on opening day (Table 4). Hypothesis H3 states that perceptions of resource availability do not differ between new and past anglers, and cannot be rejected at a = .05.

Table 4. Mann-Whitney confidence interval and test for resource availability.

New Anglers	N = 13	Median = 1.000
Past Anglers	N = 18	Median = 4.000

Point estimate for ETA1-ETA2 is -3.000
95.2 pct c.i. for ETA1-ETA2 is (-4.001,-1.000)
W = 135.0
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0037
The test is significant at 0.0032 (adjusted for ties)

Discussion

The results of this study lend support for the relationship between expected level of contacts and perceptions of crowding. The failure to reject hypothesis H1, that no difference exists between new and past anglers in perceptions of crowding, indicates that expectations of crowding conditions were no different for anglers who have fished the lake on opening day than for anglers new to the lake on opening day. It can be interpreted that the expectations for fishing conditions in terms of angler density was anticipated by both groups, and thus neither group showed a tendency to indicate that the lake was crowded.

The second hypothesis, perceptions of crowding are not related to environmental conditions, was not rejected. In this case the anglers present did not view the presence of other anglers as a negative influence on the fishing conditions of the lake. It may be argued that expectations for weather and water conditions were also a factor in determining the anglers' subjective evaluations of the fishing conditions, and thus the anglers did not view the conditions negatively.

The third hypothesis, that crowding is related to resource availability, was supported and the null hypothesis H3 was rejected. In this study the respondents did not feel crowded conditions contributed to competition for the trout available. Crowding was expressed evenly by those who had caught trout and those who had not. Perhaps the access to the lake shore had an effect on the relationship between perceptions of crowding and resource availability. The anglers in this study had ample room in terms of access to the lake shore for fishing. Had conditions been such that this access was denied, perhaps a possible relationship between the variables for resource availability and perceptions of crowding would have been more apparent.

Conclusions

The results of this study support the application of expectancy theory in crowding research. More attention is needed to the factors which contribute to the development of expectations for level of encounters. Further studies are needed to examine the importance of the temporal dimension in crowding research. Consumptive activities (i.e. hunting and fishing) are regulated by law to have specific starting and ending dates. By having such starting and ending periods, expectations and level of participation may be influenced by the seasonal aspect of these activities. As this study attempted to investigate crowding perceptions on the opening day of trout season, so might further research examine the possible changes in expectation from the opening day of the fishing season across other user days throughout the fishing season.

Further research could also investigate perceived crowding following periods of high resource availability, for example following the stocking of trout in certain streams. The dimension of competition for available resources could effect the perceptions of crowding on the part of the participants. Those participants harvesting game or fish may view crowding conditions differently from those not filling their bags or creels.

In conclusion, it must be stated that the results of this study must be viewed with some degree of caution. Larger sample sizes should be employed. The study presented here used a small sample from only one location at one particular period of time. Further research could expand on this study to note perceptions of crowding at similar sites on the opening day of fishing season, as well as differences between lakes and streams. Comparisons between lakes and streams would allow for the examination of the possible influence of environmental conditions on perceived crowding.

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HUMAN RELATIONSHIPS WITH WILDLIFE IN VERMONT

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Although fish and wildlife are common property resources owned by the public as a whole, agencies charged with decision-making about them often respond to pressure from special interest groups. While we have substantial information about the characteristics and motivations of special interest group members, we have far less knowledge about the attitudes of the general public. This study reports the results of a November, 1993 survey of the general public in Vermont regarding their attitudes about wildlife. Results indicate that Vermonters as a whole are extremely interested in wildlife, and are generally supportive of hunting and fishing. Attitudes about individual animals are highly species specific. Vermonters see man and his development as a manifestation of the natural world, but are apprehensive about our ability to interfere with natural processes. Knowledge of the general public's attitudes may point the way towards resolving many natural resource conflicts.

Introduction

With few exceptions, fish and wildlife are common property resources until they are legally captured. Ownership rights are usually vested to individual states, and fish and wildlife basically belong to residents of a state. Yet, when it comes to decision-making, policy formation is generally driven by highly vocal, special interest groups such as organized sportsmen, animal rightists, or others who oppose them. Fish and wildlife management agencies have often formulated policy around the needs of these groups on the premise that they are the most interested and affected parties. However, evidence is mounting that concern for fish and wildlife resources extends well beyond these interest groups (Kellert 1980; Glass et al 1990; Stevens et al. 1991; Boyle and Bishop 1987). Indeed, much of the success of the conservation movement as a whole can be attributed to broad public support in addition to the contributions of specific groups such as hunters and anglers. Unfortunately, while we have information on the characteristics, motivations, and perceptions of specific interest groups, we have far less knowledge of these factors for the public at large. Information on the values that the public as a whole places upon fish and wildlife, the underlying motivations for their involvement and concern, and, most especially, how the public wants its common property resources managed could help place the demands of specific interest groups in proper perspective.

In Vermont, there are diverse attitudes about fish and wildlife. Although Vermont is a rural state with a strong tradition of hunting, fishing, and trapping, recent years have seen growing polarization around these activities. Hunting and trapping in particular have a highly vocal opposition and a 1993 proposal to permit moose hunting was widely debated throughout the state.

Methods

To gain a better understanding of the views and perceptions of Vermont residents regarding fish and wildlife, a questionnaire was developed and mailed to 2,000 randomly selected Vermont households in November, 1993, following techniques described by Dillman (1978). The adult having the next birthday was asked to complete the questionnaire to reduce the chance of sex bias. After the questionnaire and two reminders were sent, a follow-up telephone survey was conducted with a randomly selected subsample of nonrespondents. Results from mail and telephone surveys were tested to determine if any differences were statistically significant. Data from the questionnaires were tabulated and frequencies run.

Results

The initial mail survey generated 669 completed questionnaires (41% response rate, after adjusting for undeliverables). There were no significant differences between mail questionnaire respondents and telephone survey of nonrespondents.

Results indicate that Vermont residents are interested in wildlife and wildlife-related issues. In fact, 98 percent of the respondents were either "somewhat interested" (40.3%) or "very interested" (57.7%) in wildlife. Even when asked how important are wildlife-related issues in context of Vermont's other current problems, 91 percent indicated that wildlife was either "very important" (41.9%) or "important" (49%).

With respect to people's relationships with wildlife, 81 percent agreed that "people are dominant, but have an obligation to minimize suffering that they may cause." By contrast, 18 percent indicated that "people and animals are equals" and only one percent felt that "people are dominant and can treat animals as they want." There was substantial support for consumptive uses of wildlife among the general public: two-thirds of the respondents disagreed with the statement that "trapping is never acceptable," and 95 percent of the respondents agreed that hunting was acceptable, at least under some circumstances.

When asked what best describes their sense of the relationship between people and nature, 64 percent of the sample agreed that "people and their developments are entirely natural and should be considered part of nature". The remainder were equally divided between those who thought "people and their developments are separate from nature" and those who were not sure since they usually didn't think in those terms.

Not all members of the animal kingdom are equally popular with the general public. To determine the species-specific effects of popularity, we constructed a hypothetical situation in which a vegetable garden was being destroyed. Assuming that various controls such as repellents, fencing, and live trapping had failed, we asked respondents if they would destroy animals from a list of selected species. The results demonstrate that the highest proportion would destroy small invertebrates (slugs and insects) and the smallest proportion would destroy large mammals (Table 1). More than 9 out of 10 respondents would eliminate Japanese beetles and slugs, while 87 percent would destroy corn borers. Mice were the only other species that more than one-half of the respondents indicated they would destroy. Less than one-half of the respondents would kill the remaining species destroying their garden. White-tailed deer and dogs were the animals that fewest of the respondents would destroy.

A question was also asked concerning the acceptability of taking animals from the wild and keeping them in captivity (Table 2). Only in two cases--rehabilitation after injury and for scientific research--did more than one-half of the respondents agree that keeping a wild animal in captivity is acceptable. However, the respondents were ambivalent with respect to confining wild animals for classroom education and public education displays. Keeping wild animals in captivity for pets, for commercial entertainment, and as breeding stock for commercial purposes were soundly rejected.

Table 1. Reaction of Vermont residents toward destruction of vegetable garden pests after other control measures failed.

Species	Would destroy		Would not destroy		Not sure	
	Number	Percent	Number	Percent	Number	Percent
Japanese beetles	584	91.7	20	3.3	32	5.0
Slugs	578	91.2	22	3.4	34	5.3
Corn borers	549	87.0	23	3.6	59	9.4
Mice	455	72.5	119	19.0	54	8.5
Woodchucks	301	47.8	243	38.1	88	14.1
Crows	269	42.9	278	44.1	80	13.0
Blackbirds	232	36.8	293	46.4	104	16.9
Skunks	225	35.8	288	45.4	116	18.8
Raccoons	195	30.9	327	51.7	107	17.4
Cottontail rabbits	151	24.2	353	56.4	118	19.3
Dogs	110	17.3	406	64.4	114	18.3
White-tailed deer	88	14.1	441	70.3	96	15.5

Table 2. Public acceptance of taking animals from the wild and keeping them in captivity for specific purposes.

Purpose	Acceptable		Unacceptable		Not sure	
	Number	Percent	Number	Percent	Number	Percent
Scientific research	326	53.6	191	31.2	93	15.2
Classroom education	249	41.5	256	42.0	100	16.5
Public education displays	242	40.2	255	42.1	106	17.7
Commercial entertainment	55	9.1	495	81.3	57	9.6
Keep as a pet	60	10.1	483	79.4	63	10.4
Rehabilitation after injury	588	93.2	14	2.2	27	4.6
Breeding stock for commercial purposes	84	14.0	403	66.0	121	20.0

Despite the fact that only 24 percent of Vermonters are active hunters and 40 percent are active anglers, most Vermonters did not object to harvesting fish and wildlife providing ce ain conditions were met (Table 3). In fact, 81 percent of the respondents disagreed with the statement that "It's wrong to kill wildlife for any reason." More than four out of five agreed that harvesting of fish and wildlife was acceptable if it was not wasted or populations were not seriously reduced. Surprisingly, the respondents were more ambivalent relative to the acceptability of collecting insects for pleasure.

Table 3. Public acceptance of the harvesting of fish and wildlife.

Statement	Agree		Disagree		Neutral	
	Number	Percent	Number	Percent	Number	Percent
Wildlife and fish can be harvested if they are not wasted	538	84.1	39	6.1	63	9.8
Wildlife and fish can be harvested if their populations are not seriously reduced	559	87.5	27	4.3	53	8.3
It's wrong to kill wildlife for any reason	45	7.0	521	81.3	75	11.7
It's wrong to collect insects for pleasure	198	30.5	243	37.4	209	32.2

Vermont residents gave considerable support to wildlife even when conflicts were perceived with human development (Table 4). In fact, over 90 percent of the respondents disagreed with the statement that "wildlife is worth nothing if a dollar value cannot be put on it." A majority of respondents also rejected statements that "economic development is more important than wildlife," and "fish and wildlife protection is over-emphasized while ignoring human needs." Slightly more than one-half of the respondents agreed that mankind has dominion over all animals, but there was some ambivalence with respect to public safety being more important than wildlife.

There was disagreement about man's ability to manage wildlife and the sensitivity of professionals to public wants (Table 5). Nearly one-half of those responding thought wildlife biologists were the people best qualified to make decisions about wildlife populations and programs. However, the statement that "fish and wildlife professionals only care about sportsmen" was soundly rejected. By the same token, only 18 percent felt wildlife professionals were out of touch with the public, but another 29 percent were not sure. On the other hand, 60 percent of the respondents agreed that "interfering with nature is usually a mistake."

Table 4. Public views toward human-wildlife conflicts.

Statement	Agree		Disagree		Not sure	
	Number	Percent	Number	Percent	Number	Percent
Economic development is more important than wildlife	36	5.6	488	75.8	119	18.5
If a dollar value cannot be put on wildlife, it is worth nothing	33	5.1	587	91.2	23	3.6
We overemphasize protecting fish and wildlife while ignoring human needs	97	15.1	430	67.0	115	17.9
Only economically important wildlife should be protected	43	6.6	530	82.3	71	11.0
Mankind has dominion over all animals	202	31.6	325	50.8	113	17.6
Public safety is more important than wildlife	240	37.6	194	30.4	205	32.1

Table 5. Public perceptions of wildlife managerial capabilities and responsiveness.

Statement	Agree		Disagree		Not sure	
	Number	Percent	Number	Percent	Number	Percent
Wildlife biologists are the people best qualified to make decisions about wildlife populations and programs	317	49.3	180	27.9	147	22.8
Interfering with nature is usually a mistake	386	60.0	126	19.6	131	20.4
Wildlife professionals are out of touch with the public	119	18.4	306	47.4	220	34.1
People really don't know enough to manage wildlife populations effectively	196	30.5	268	41.7	179	27.8
Fish and wildlife professionals only care about providing fish & wildlife for sportsmen	59	9.2	468	72.8	116	18.0

Discussion

Human relationships with wildlife are complex and may be analyzed at different levels. At the highest level, relationships exist in the abstract and are primarily intellectual. Clearly, the public as a whole has an immense interest in wildlife. For example, 91 percent of the respondents in this general population survey believed that wildlife was important to them. They believed that people and their developments are entirely natural, but they felt apprehensive about human interference with nature. They indicated quite clearly their belief that the appropriate role for people was as stewards; it is all right to use the natural environment to satisfy human needs so long as it is done responsibly and does not endanger natural populations.

At a more specific level, however, attitudes can be much more varied, and the emotions can exert a stronger pull. As our garden example indicated, reactions may be quite species specific: these Vermonters were much more willing to tolerate garden damage from large mammals than from insects or mice. Although people may understand the ecological importance of a species such as the timber rattlesnake, it is quite another thing to encounter one along a trail. These preferences may be the result of anthropomorphism, which is generally greater for mammals and birds than for other classes of animals. For example, stories about mammals and birds are targeted to reach much younger children than are stories about insects or crustaceans (More 1979). The preferences we form at an early age may have policy implications for the restoration of rare and endangered species.

Fish and wildlife harvesting also received strong support among the general public in Vermont, with the proviso that the harvested fish and wildlife be utilized and that the harvesting be kept within sustainable limits. Still, there are subpopulations with strongly divergent views. Considerably more research is needed to understand the underlying meanings of attitudes toward wildlife and the intensity of people's commitments to these attitudes. A person may, for example, be opposed to hunting in general, but may tolerate hunters under specific circumstances or by specific individuals.

Alternative methods may be necessary. Mail questionnaires may not lend themselves well to determining the level of commitment respondents have regarding their attitudes toward wildlife. Responses may be based upon misunderstanding, limited knowledge, or transient emotions, or they may reflect deeply held values that are unlikely to change under any circumstances. Follow-up studies are needed to determine the tolerance of opponents to specific wildlife uses, underlying values, and sensitivity to new information. Clearly, the deeper examinations of public acceptability of people-wildlife interrelationships will require more costly personal interviews rather than mailed survey instruments.

In sum, interest in wildlife and wildlife-related issues extends well beyond the narrow focus of specific interest groups to the public as a whole. The problems of incorporating divergent values into the decisionmaking process clearly present a hurdle to wildlife management agencies. Yet, the public as a whole often represents the middle ground between conflicting groups, and although more emphasis on broad public involvement may not reduce conflicting viewpoints, it can point the way towards this resolution.

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Outdoor Recreation Management



SPECIFIC RESPONSIBLE ENVIRONMENTAL BEHAVIOR AMONG BOATERS ON THE CHESAPEAKE BAY: A PREDICTIVE MODEL PART II

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This paper examines predictors of boater behavior in a *specific behavior* situation, namely the percentage of raw sewage discharged from recreational vessels in a sanitation pumpout facility on the Chesapeake Bay. Results of a multiple regression analysis show knowledge predicts behavior in specific issue situations. In addition, the more specific the behavior indicator, the better predictive ability that indicator will have on behavior.

Introduction

Responsible environmental behavior (REB) is defined as any individual or group action aimed to do what is environmentally right to help protect the environment (Sivek & Hungerford, 1989/90). This behavior involves a conscious awareness of environmental problems among individuals or groups of people while demonstrating an understanding and sensitivity of the importance for a quality environment. In addition, the knowledge of action skills to effectively partake in REB are necessary for an individual to actively participate in pro-environmental action (Hines et al., 1987; Marcinkowski, 1988; Hungerford and Volk, 1990).

The purpose of this paper was to present findings for Part II of a model of responsible environmental behavior. Part I of the model, which focused on the relationship between four socio-demographic variables, three general environmental variables, and general responsible environmental behavior, was presented at the 1993 NERR conference. This paper examined predictors of a *specific responsible environmental behavior*, namely the percentage of raw sewage Maryland boaters discharged from recreational vessels in a sanitation pumpout facility on the Chesapeake Bay. According to Heberlein and Black (1976), more specific measures of behavior are stronger indicators of specific behavior than are general measures of behavior. Several specific-issue variables were used to test Heberlein and Black's specificity claim by using indices such as knowledge of water pollution issues, awareness of the consequences of raw sewage on water quality, personal commitment to resolve water pollution issues, and situational factors that constrain sewage pumpout station usage.

Methods

Data were collected during fall, 1992, through mail surveys sent to a stratified random sample of owners of vessels 22 feet or larger in Maryland. The instrument included measures of knowledge of water pollution issues, awareness of the consequences of raw sewage on water quality, personal commitment to resolve water pollution issues, situational factors that constrain sewage pumpout station usage, and specific responsible environmental behavior (percentage of raw sewage boaters discharged). A total of 291 surveys were returned, representing a 41 percent response rate. In order to assess nonresponse bias, phone interviews were conducted with a random sample of nonrespondents (N=30). Of those phone survey respondents who recalled receiving a mail survey last fall (54%; N=19), 63 percent were classified as *nonusers* based on their reason for not completing the survey, i.e., they did not go boating in 1992. Another 61 respondents did not meet criteria necessary for analysis in this study and were eliminated from the sample (Cottrell, 1993).

Results

The uniqueness of those boaters surveyed in this study was likely due to the random stratification process used to sample registered boat owners with 22 foot boats or larger in Maryland. Of the boat types reported, 56 percent were power boats and 44 percent were sailboats. The average boat length was 31 feet. The mail survey went to registered boat owners. Ninety-seven percent of this sample were males with an average age of 50, while 78 percent were married. Thirty-six percent have children living at home (Cottrell, 1993).

This group represents a well educated, affluent, conservative, white collar segment of the population. For instance, 63 percent have a college degree, including 39 percent who participated in post graduate work. More than 30 percent of the respondents had an earned income of more than $100,000 in 1992, followed by 35 percent between $60,000 and $99,999. The median income earned was approximately $70,000 as compared to $30,000 in a study of boaters at large in Miami, Florida (Noe and Snow, 1990) and a median range of $30,000 to $40,000 for boaters in a Delaware study (Falk et al., 1985). There was a significant positive correlation between income and education. In reference to political affiliation, 51 percent were Republicans in comparison to 22 percent Democrat. Another 23 percent of the boaters were independents. Subsequently, 56 percent were conservative and 22 percent were liberals. Pertaining to occupational status, more than 60 percent of the total respondents were white collar workers. To illustrate, 31 percent reported a professional occupational status while 21 percent indicated that they were in management. Another nine percent were in a business related occupation (Cottrell, 1993). These boaters were relatively experienced with an average of 21 years experience and 77 percent perceived themselves as advanced or expert boaters. This group went boating an average of 35 times per year on the Chesapeake Bay. As number of days boating on the bay increased, both boat length and perceived skill level increased. Years experience and boating skill level increased with age.

In reference to the relationship between sociodemographics and the pool of specific issue variables, as age increased an awareness for the consequences of raw sewage on water quality decreased (Cottrell, 1993). Power boaters were more aware of the consequences of dumping raw sewage than were sailboaters. Boaters with an earned income between $40,000 and $79,999 in 1992 were the most aware of the consequences of raw sewage discharge on water quality. More educated, affluent, older boaters were less likely to use a sewage pumpout station than were boaters on the lower end of the socioeconomic scale. Meanwhile, powerboaters (72%) reported pumping a greater percentage of waste in a pumpout station than sailboaters (44%).

A two-step process was used in the operationalization of several indices for analysis in this study. A factor analysis was carried out to examine four scaled variables. Those scales were knowledge about environmental issues related to water pollution, personal commitment to resolve water pollution, awareness of consequences of water pollution, and situational factors that constrain boater use of sewage pumpout stations (Cottrell, 1993). Next, Cronbach alpha was utilized to test the internal consistency of each index. A perceived knowledge of water pollution issues index was computed as the mean of responses to four statements. The level of reliability was acceptable (Cronbach Alpha = .84). Measurement of personal commitment to resolve water pollution problems was accomplished by computing the mean of responses to five related statements. The intercorrelation of the five items resulted in an overall reliability of .78. Next, the combined

strength of two factors identified in a factor analysis provided an internally consistent scale (Cronbach Alpha = .77) to measure boater awareness of consequences of raw sewage discharge on water quality. This scale consisted of six items probing the general degree of awareness about the harmful effects raw sewage has on health and water quality. Finally, to assess those situations that might constrain or enhance boater use of sewage pumpout stations, a situational factors index was created as the sum of statements specifically related to the use of a sewage pumpout station. This scale had the highest level of reliability (Cronbach Alpha = .86) of all the indices examined.

An attempt was made to develop an index to measure boater knowledge of the laws pertinent to raw sewage disposal. The reliability of those items in the scale were to low, thus all three items were used as separate independent variables in the multiple regression analysis (Table 1).

Table 1. Reliability statistics for the knowledge about the laws index (n=230).

Knowledge of Law Statement	Item Mean[a]	Standard Deviation	Corrected Item-Total Correlation	Alpha If Item Deleted
How far offshore must you be before you can legally discharge human waste at sea?	.69	.47	.38	.32
How far offshore on the Chesapeake Bay must you be before you can legally discharge human waste?	.60	.49	.33	.40
Which one of these organizations is responsible for enforcing dumping at sea violations?	.70	.46	.27	.50
Overall Index[b]	2.0			.51

[a] Scores for these items were coded 0=incorrect and 1=correct.
[b] Range = 0 - 3

Drawn from a previous study of sewage pumpout station use on a national level (Price Waterhouse, 1992), specific responsible environmental behavior, the primary dependent variable in this study, was concerned with what boaters do with their marine sewage (percentage of waste discharged in a sewage pumpout station). Determined from a three part question, this item asked respondents to approximate in 1992 how much raw sewage they discharged into the water more than three miles off-shore (WASTE1), into the water less than three miles off-shore (WASTE2), or by pumping into a sanitation pumpout facility on-shore (WASTE3). Percentages add up to 100 percent. Waste3, percentage of human waste pumped in a sanitation pumpout facility, represents SREB. Approximately nine percent of the raw sewage discharged from recreational vessels in this study was reportedly pumped directly into water more than three miles offshore (WASTE 1). Meanwhile, 31 percent was discharged directly into the water less than three miles from shore (WASTE 2), thereby reflecting illegal behavior. Fifty-nine percent of the waste was reported to be pumped into a sanitation facility (WASTE 3) which indicates appropriate behavior (Table 2).

Table 2. Average waste discharged by Maryland boaters.

	N=210
WASTE 1: Discharged directly more than 3 miles offshore	9.5%
WASTE 2: Discharged directly Less than 3 miles offshore	31.4%
WASTE 3: Discharged by using a sanitation pumpout facility	59.1%
	100.0%

A multiple regression analysis showed eight predictors of specific responsible environmental behavior (% of waste pumped in a pumpout station) which collectively explained 46 percent of the total variance (Table 3). Three background variables (education, B=-.231, p<.0[illegible]; boat length, B=-.246, p<.001; and years of boating experience, B=-.248, p<.001) were negatively related to sewage pumpout station usage. Environmental concern, representing a pool of general environmental variables, was a moderate predictor (B=-173; p<.01). Four specific issue predictors included knowledge of water pollution issues (B=.140; p<.05), knowledge of the law about dumping on the bay (B=.281; p<.001), knowledge of the law about dumping at sea (B=-.133; p<.05), and awareness of the consequences of raw sewage on water quality (B=.426; p<.001).

Table 3. Results of multiple regression of background variables, general environmental variables, specific issue variables, general responsible environmental behavior, and situational factors on specific responsible environmental behavior (n=177).

Independent Variables	Dependent Variable: Specific Responsible Environmental Behavior — *Regression Model* r	Beta
Background Variables		
Income	-.144	-.030
Age	-.147***	-.014
Stand on Political Issues	-.063	-.015
Education	-.170*	-.231***
Boat Length	-.333***	-.246***
Boat Skill Rating	-.122	-.068
Years Experience	-.202**	-.248***
Days Boating On Bay	.065	.028
General Environmental Variables		
Environmental Concern	.028	-.173**
Verbal Commitment	-.032	-.089
Knowledge of Ecology	-.011	-.063
Specific Issue Variables		
Knowledge of Water Pollution	.194**	.140*
Knowledge of Dumping On Bay	.193**	.281***
Knowledge of Dumping Offshore	-.155*	-.133*
Knowledge of Enforcement	-.120	-.067
Awareness of Consequences	.447***	.426***
Commitment to Issue Resolution	.108	-.032
Other Variables		
General Responsible Environmental Behavior	.100	-.031
Situational Factors	.333***	.115
R^2 Entire Model		.455***

*** Significant at .001
** Significant at .01
* Significant at .05

Table 3 summarizes the results of a multiple regression invoked to determine the contribution of nineteen independent variables, which are categorized into four dimensions, in explaining the variation in the amount of raw effluent pumped into a sewage dump station (SPS). Three background variables, one general environmental variable, and four specific issue variables accounted for 46 percent of the variance in the amount of sewage discharged on shore. Neither general responsible environmental behavior nor situational factors contributed to the model, although the situational factors scale was significant and positively correlated with SREB. An awareness of the consequences of dumping raw sewage (B=.416; p<.001) in the bay was the most important indicator of SREB followed by knowledge of the law about dumping on the bay (B=.281; p<.001), years boating experience (B=-.248; p<.001), boat length (B=-.246; p<.001), education (B=-.231; p<.05), environmental concern (B=-.173; p<.01), knowledge about water pollution (B=.140; p<.05), and knowledge of the law about dumping offshore (B=-.133; p<.05), respectively.

Conclusions

Eight predictors of specific responsible environmental behavior (SREB), as reflected by the percentage of waste discharged in a sewage pumpout station, were determined. The combination of all eight predictors accounted for 46 percent of the total variance explained. Several background variables, initially hypothesized to have an indirect positive effect, were found to have a direct relationship with SREB; however, a negative influence was noted for education, boat length and years experience on SREB. Of the general environmental variables, originally hypothesized to have an indirect positive effect, environmental concern had a direct inverse influence on SREB. The specific issue category of variables was found to have the strongest influence on SREB. For instance, knowledge of water pollution, knowledge of no discharge on the bay, and awareness of consequences each had a direct positive effect; while knowledge of the law about discharge offshore was found to inversely effect SREB. Surprisingly, neither general responsible environmental behavior (GREB) nor situational factors when combined with the other variables in the model influenced the percentage of waste pumped in a sewage pumpout station. GREB represented respondent reports to ten "true-false" items. Each of the statements represented a specific action taken towards an environmental issue. On a scale of one to ten, the mean response was 4.9; that is, on average, boaters reported participating in five out of ten pro-environmental actions. It was proposed that general pro-environmental behavior would directly and positively influence specific issue responsible behavior. That was not the case in this study.

With regard to situational factors, the composite of five statements, in essence, measured a convenience scale of sanitation pumpout station use. As expected, this scale was significantly and positively correlated with SREB, yet it was not found to predict SREB when the direct effect was controlled by the other variables in the regression model. On a bivariate basis, as boaters level of agreement about the convenient use of an SPS increased, they were more likely to use a sewage pumpout to discharge a greater percentage of waste after a boating trip.

In summary, results show knowledge predicts behavior in specific issue situations. In addition, to support Heberlein and Black's (1976) specificity claim, this study showed that the more specific the indicator was in relation to the actual behavior being measured, the stronger predictive ability that indicator will have on behavior.

Implications

Implications for marina management are that as boat length increases, boat owner perceptions of the convenience of sewage pumpout station usage decreases, thus they are less likely to use a pumpout station. Findings in this study indicate that mobile pumpout stations may be an alternative solution to encourage further use. Secondly, knowledge variables in this study proved to be good predictors of pro-environmental behavior. Continual public education about SPS locations and the benefits derived from not discharging in the Bay might encourage further SPS usage.

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POTENTIAL REVENUES FROM A NEW DAY-USE FEE

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The Corps of Engineers will be implementing a new user fee at day-use areas during the next two years. This paper presents the procedures used to estimate the revenue that the new fee would generate at six Corps projects located across the U.S. The results suggest that revenues will fall well short of the naive projection calculated on the assumption that the new fee will not affect the current level of visitations.

Introduction

The Army Corps of Engineers is one of the leading federal agencies in providing recreational opportunities. In fact, the Corps accommodates more visits at its recreation sites than any other federal agency except the U.S. Forest Service. Both day-use and camping facilities are provided at most Corps projects throughout the U.S.

Although the Corps has a long history of charging fees at its campgrounds, it has not charged fees at it day-use facilities in the past. This is about to change due to provisions included in President Clinton's compromise budget package passed last summer by Congress. The budget package reduced the Corps' federal operating budget by $18 million, and it granted the Corps the authority to charge fees at its day-use facilities, beginning in 1994.

Because user fees have not been charged historically at day-use areas, the Corps had no information about how current users would respond to the proposed fee system. Consequently, a study was conducted to learn more about Corps day-users' attitudes toward fees and how they would respond to the user fee. One of the major objectives of the study was to estimate the revenue that the Corps would collect at selected Corps projects. The purpose of this paper is to present the procedures used to estimate day-use fee revenues and to compare the estimated revenue projections to a naive estimate of revenue.

Study Design and Data Collection Procedures

A total of eighteen Corps projects were visited to assess their suitability for the fee study. Criteria used to assess each project are: at least two day-use areas that contained beaches, picnic table and boat launching facilities, which are required facilities for charging a fee; day-use areas with varying degrees of development; different locations across the U.S. so that regional differences, if any, in users' reactions to fees could be considered; a mix of highly accessible and remote projects; and adequate locations where traffic could be safely intercepted to collect name and addresses of users.

Based on the above criteria, the following six projects were selected for the study: Burnsville, West Virginia; Strom Thurmond on the South Carolina-Georgia border; J. Percy Priest, Tennessee; Truman, Missouri; Canyon, Texas; and Mendocino, California. Two day-use areas at each project were selected for collecting the names and addresses of current users. A sampling plan was then developed for each day-use area at each project.

A questionnaire was developed and pretested prior to the data collection phase of the study. The final version of the survey instrument contained general questions about the recreational activities of respondents, the types of facilities and services they considered important, users' assessment of the quality of the day-use facilities they visited, and detailed information about their trip to the day-use area on the day they were contacted.

Questions about respondents' trip expenditures and the number of trips they had made to the day-use area in the last year were also included. Finally, a question was designed to determine how current users would respond to a fee system and the number of trips they would make to the day-use area at alternative fee levels. Two types of fees were included: an annual fee for the day-use area and a daily fee. Both fees were expressed on a per-vehicle basis.

A sample of day users was collected at each project by randomly stopping vehicles and collecting the name and address of the driver. Those selected for the sample were then mailed a survey and appropriate follow-ups to obtain the desired information. A total of 1405 of the 2522 deliverable surveys were completed and returned, yielding a response rate of 55.7 percent.

Results

Sample Characteristics. The socio-demographic characteristics of the day-use respondents are summarized in Table 1. The average age of respondents was slightly more than 40 years, and males accounted for over 60 percent of all respondents. Average household size was 3.1 persons and respondents reported an average of 13.3 years of education and an income of $36,600. Respondents who identified themselves as members of minority groups accounted for 11.6 percent of all respondents. It should be noted that all socio-demographic characteristics reported in Table 1 are statistically different at the 10 percent level across the six projects.

Table 1. Socio-demographic characteristics of Corps day-use visitors.

Characteristic	Average	Range Among Projects
Age (years)	40.2	35.5 to 44.7
Sex (% Male)	61.5	56.3 to 69.4
Household Size	3.1	2.9 to 3.3
Education (years)	13.3	12.5 to 13.9
Household Income	$36,300	$25,600 to $40,100
Race (% non-caucasian)	11.6	4.0 to 18.9

Selected trip characteristics are reported in Table 2 (see next page).

Table 2. Trip characteristics of Corps day-use visitors.

Characteristic	Average	Range Among Projects
Number of People in Party	3.2	2.9 to 3.4
Hours Spent at Site	5.0	4.2 to 6.7
One-Way Travel Distance	30.2	12.0 to 45.0
Trip Expenses	$36.40	$16.50 to $46.80
Annual Trips to Site	21.0	8.7 to 40.7
Quality Rating for Site[a]	3.7	3.2 to 4.0
Preference Rating for Site[b]	2.3	2.2 to 2.5

[a] The following numerical scale was used to measure quality: 1=poor; 2=fair; 3=good; 4=very good and 5=excellent.

[b] The following numerical scale was used to measure preferences:
1=I would not go elsewhere in this region;
2=I would go elsewhere, but I prefer this day-use area;
3=It makes no difference to me whether I use this day-use area or another area;
4=I would come here again, but I would prefer to go elsewhere; and
5=I would not come here again.

Overall party size was 3.2 and respondents spent an average of five hours at the site. One-way travel distance was about 30 miles and total trip expenses averaged $36.40 for all lakes or projects. Respondents took an average of 21 trips to the site in a twelve-month period. On a five-point scale with one being poor and five being excellent, the sites visited by the respondents were rated as 3.7. Users' preferences for the areas visited were also rated on a five-point scale with one signifying a high level of preference and five representing a low level of preference. The overall rating of respondents was 2.3 on the five-point scale. Again, all trip-related characteristics reported in Table 2 exhibited a statistically significant difference at the ten percent level across lakes.

Respondents were also asked a series of questions to ascertain their attitudes toward day-use fees. The results strongly indicate that many respondents have very strong negative attitudes toward fees. For example, almost half (48.5%) of all respondents **strongly agreed** that they should not have to pay a fee to use the Corps day-use areas. Responses to other fee-related questions verified this strong negative attitude. This finding, of course, has a potentially large impact on the revenue collected from a user fee. We now turn to the procedures used to estimate revenues.

Revenue Projections. The revenue portion of the study was designed on the assumption that both a daily per vehicle fee and an annual pass would be offered to visitors if a fee system was implemented. Consequently, the new fee system would present current visitors with three choices: pay the daily per vehicle fee; purchase the annual pass; or, pay neither fee and stop visiting the site. Respondents were presented these options in the following question:

> There is legislation before Congress that would establish day-use fees at Corps of Engineer day-use areas, like the one where your vehicle was stopped. The Corps is interested in your views on recreation day-use fees. Suppose a recreation day-use fee was charged at the recreation day-use area where your vehicle was stopped, and at other similar Corps-operated day-use areas nationwide. If the fee was $____ per vehicle per day, or $____ per vehicle for an annual pass that would allow you to use all the day-use areas located on this lake for one year, which option would you personally choose? (please circle one number)
>
> 1. I would pay the per-vehicle per-day fee
> 2. I would purchase the annual pass
> 3. Neither--I would not visit Corps day-use areas anymore

Fee levels ranging from one to five dollars for the daily fee and from $10 to $100 for the annual pass were written in the appropriate spaces prior to mailing the surveys.

Responses to the fee question were analyzed to determine how the introduction of a fee system would impact different subgroups of current visitors. A comparison of users who self-selected the "neither fee" option and those who chose one of the two fees is shown in Table 3. It should be noted that over 40 percent of all respondents indicated they would not visit the Corps areas if a fee was charged.

Table 3. Socio-demographic and trip characteristics of Corps day-use visitors, by willingness to pay day-use fee.

Characteristic	Would Pay Fee	Would Not Pay Fee
Average Age (years)	40.3	40.0
Sex (percent Male)*	58.9	65.3
Household Size (people)	3.1	3.0
Education (years)*	13.5	13.0
Household Income ($)*	38,600	32,800
Race (% caucasian)	87.5	89.4
Party Size* (persons)	3.3	3.0
No. of Hours spent at Rec. Area*	5.4	4.5
One-Way Travel Distance*	32.8	26.8
Total Trip Expenses*	$29.80	$25.33
Quality rating for site[1]*	3.76	3.61
Preference Rating for Area Visited[2]*	2.2	2.4
No. of Visits to Rec. Area in Last 12 Months*	16.6	27.3
Visited Lake Area in Last 12 months where day-use fee was charged? (% yes)*	26.8	12.2

[1] See Table 2. [2] See Table 2.

* denotes a statistically significant difference in group means at the 10 percent level, two tail test.

No statistically significant difference exists in the two groups in terms of age, household size, and the percent minority group members. The latter finding is particularly important, as one of the objectives of the fee study was to determine whether the implementation of a fee system would disadvantage current minority users more than non-minority users.

Significant differences do, however, exist for all other variables in Table 3. The group that selected the "neither fee" option has a higher percentage of males, a lower level of education, and a lower income level. The latter difference is especially important in that one of the questions to be addressed in the study is whether a fee system would discriminate against low-income users.

In terms of trip-related variables, those respondents who indicated they would no longer visit the site with a fee system took over 60 percent more trips during the last twelve months than their counterparts who would pay one of the two fees. One would think that this group would opt for the purchase of the annual pass. However, this was not the case.

Differences in other trip-related variables are more consistent with expectations. Respondents who were unwilling to pay a fee spent less time at the site, reported lower quality and preference ratings for the areas visited, and a smaller fraction had paid a fee to use a day-use area located on a lake during the last year. The latter variable may partially explain the aversion to fees expressed by the "neither fee" group. Historical experience in paying fees is often a significant factor in explaining people's attitudes toward fees. Responses to the fee question also varied significantly across the six projects, thereby suggesting that regional differences in response to fees exist.

Responses to the three-choice fee question were also used to estimate the revenue that could be collected at the six projects if a fee system was implemented. A polychotomous choice selectivity model was used to obtain the information needed to estimate revenues at each lake. This model involved two steps. In the first, a multinomial logit model is used to partition respondents in to three categories: those predicted to pay the daily fee; those predicted to pay the annual pass fee; and those predicted to pay neither fee. The dependent variable in the multinomial logit model is limited to three values corresponding to the three choices available to respondents: "zero" if the respondent indicated they would not pay either fee; "one" if the respondent chose the daily fee option; and "two" if the respondent chose the annual pass. Independent variables are used to "explain" the observed differences in the responses to the fee question.

This initial step in the polychotomous choice selectivity model provides an estimate of the number of people in the sample who would choose the annual pass option at alternative daily and annual fee levels. Revenue projections from the sale of annual passes are calculated by multiplying the number of people in the sample who would purchase the annual pass at alternative prices. The revenue collected from the people in the sample is then expanded to the population using appropriate expansion factors.

In the second step, data from the respondents who chose the daily-fee option are used to estimate a demand equation describing the number of visits that would be made to the site at alternative daily fee levels. Ordinary least squares is used to estimate the demand equation, and the statistical results obtained in the first step are used to correct for the sample selection bias. The dependent variable is the number of visits respondents said they would have made during the last twelve months if the fees specified in the fee question had been charged.

The estimated demand model provides a price-quantity relationship between the daily fee and the number of visits that would be made by respondents who chose the daily-fee option. This price-quantity relationship is used to estimate the revenue that would be collected through the daily fee from the sample respondents at different fee levels. Revenues are then projected to the population using appropriate expansion factors. Finally, revenues from the daily fee and annual pass fee are summed to estimate the total revenue that could be collected.

The total revenue projections for the six projects at alternative fee levels are shown in Table 4. The estimates are in matrix form, with the rows representing annual pass fee levels ranging from $10 to $50 in $10 increments, and the columns representing alternative daily fee levels ranging from one to five dollars, in one-dollar increments. Each cell in the matrix represents the projected revenue associated with the annual pass fee and daily fee indicated for the intersecting row and column. For example, a daily fee of three dollars and an annual pass fee of $20, yields an estimate of $1.53 million in total revenue.

Table 4. Projected revenue at alternative fee levels for the six Corps projects ($1,000).

		Daily Fee				
		$1	$2	$3	$4	$5
Annual	$10	899	1,033	988	934	914
Fee	$20	1,124	1,494	1,532	1,438	1,379
	$30	1,124	1,534	1,624	1,457	1,302
	$40	1,045	1,548	1,548	1,320	1,038
	$50	1,051	1,615	1,705	1,496	1,090

Projected revenues vary from a low of about $900,000 at the $10 annual fee and $1 daily fee and the $10/$3 combination, to a maximum of $1.7 million at the $50/$3 fee combination. However, the fee combination of $30/$3 produces almost as much revenue--$1.6 million. Furthermore, 14 of the 25 fee combinations result in projected revenues of more than $1.3 million. Hence, the Corps has some flexibility in setting the fee levels without incurring large losses in revenue. Given the negative attitude of users toward fees, opting for a lower initial fee combination and sacrificing some revenue may be a prudent policy to reduce visitor dissatisfaction and complaints caused by the new fee system.

It is important to note that the revenue patterns in Table 4 is the result of a complex array of factors, including the total number of vehicles entering the designated fee areas in 1992, expansion factors, user's attitudes toward fees and the percent of respondents categorized in the "daily fee", "annual pass" and "neither fee" options by the multinomial logit model. The rate at which respondents convert to annual passes as the daily fee increases is another important factor, as is the rate at which users convert to the daily fee as the annual pass increases in price. Finally, the rate at which users convert to the "neither fee" option as both the daily fee and annual pass increase in price is important.

In Table 5, "naive" revenue projections are shown for the various fee levels. These projections were calculated on the naive assumption that all visitors would continue to use the site after the fee was implemented, and that they would take the same number of trips as before the fee system. Whether visitors would choose to purchase an annual pass or a daily pass was determined by choosing the least-cost alternative. For example, if the fee combination was $20/$2, and a visitor took ten or fewer trips, it was assumed the visitor would purchase the daily pass each trip. On the other hand, if the visitor took more than ten trips, it was assumed that the day user would purchase the annual pass at that fee combination.

Table 5. "Naive" projected revenue at alternative fee levels for the six Corps projects ($1,000).[a]

		Daily Fee				
		$1	$2	$3	$4	$5
	$10	1,395	2,009	2,286	2,389	2,843
		(64%)	*(51%)*	*(43%)*	*(39%)*	*(32%)*
Annual	$20	1,700	2,790	3,417	4,018	4,520
Fee		*(66%)*	*(54%)*	*(45%)*	*(36%)*	*(31%)*
	$30	1,839	3,146	4,099	2,926	5,595
		(61%)	*(49%)*	*(40%)*	*(30%)*	*(23%)*
	$40	1,897	3,401	4,511	5,579	6,178
		(55%)	*(46%)*	*(34%)*	*(24%)*	*(17%)*
	$50	1,838	3,547	4,780	5,930	6,974
		(57%)	*(46%)*	*(36%)*	*(25%)*	*(16%)*

[a]Numbers in parentheses represent model revenue projections as a percent of naive projections.

The naive projections range from a low of $1.3 million to almost $7 million. More importantly, the actual projections are much lower than the naive projection. In fact, in the best of circumstances, the actual projection is only about two-thirds of the naive projection. In the worst case, the actual projection is only 16 percent of the naive projection. These comparisons clearly indicate the importance of considering visitors' attitudes toward fees and their stated reaction to them when projecting revenues from fees. The naive projections usually will be much higher than actual revenues. We believe the procedures used in this study are potentially very useful to recreation managers who must project revenues from recreation user fees.

THE DEVELOPMENT OF A RECREATIONAL LAND CLASSIFICATION SYSTEM

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The New York State Office of Parks, Recreation and Historic Preservation has had a land classification system in place since 1972. This system was developed during the creation of the first Statewide Comprehensive Outdoor Recreation Plan. This system has become the backbone of the Park Master Planning Process. During the past few years the New York State Park System has undergone serious evaluation. This evaluation determined that the Parkland Classification System is out of date and no longer addresses today's needs or issues. This paper attempts to illustrate how the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) is approaching the redesign of their Recreational Land Classification System.

The Purpose of a Recreational Land Classification System

Since New York first acquired the Niagara Frontier to protect it from the threat of development and obtained Washington's Headquarters in Newburg, the state's park system grew faster than ever imagined. Today the park system encompasses 150 parks, 35 historic sites (many of which are on both the State Register of Historic Places and the Federal Register of Historic Places), 19 boat launching facilities, 6 canal parks, 13 marinas, 14 Urban Cultural Parks, hundreds of miles of parkways and hundreds of miles of trails.

These parks and sites contain some of New York's most magnificent natural features. For example, within the park system there are 160 lakes and ponds, hundreds of acres of wetlands, miles of coastal shorelines, mineral springs, gorges, sand dunes and mature forests. The U.S. Geological Service has identified 67 parks with important and unique geologic features and the National Heritage Trust has also identified 45 parks that contain rare plants, animals and exemplary natural communities.

Through a Resources Steering committee, four main purposes of a classification system were identified: 1) to group parks and historic sites with similar natural, cultural and recreation resource characteristics; 2) to provide broad management, protection and development directions; 3) to provide guidance for the development of management and master plans; and 4) to inform the public/user as to what type of experience they may expect at a specific park or site.

The State Land Recreational Planning System

The State Land Recreational Planning System is a management system designed to meet the changing recreational needs of the public as well as protecting and preserving the natural resources unique to each site. It is a system that responds to identified public needs and involves public input throughout the planning and implementation process. Figure 1 shows how the Land Classification System (LCS) fits into the planning process (Figure 1).

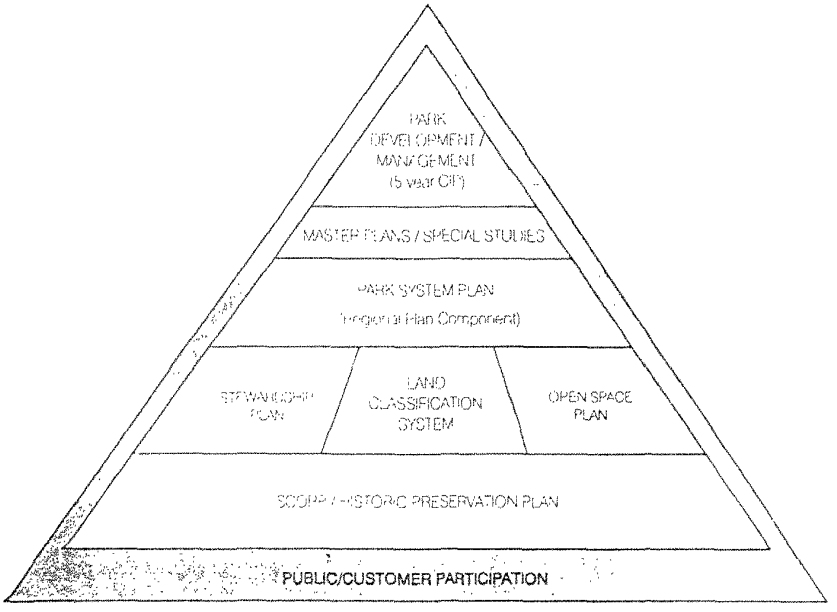


Figure 1. OPRHP's planning system.

At the base of the pyramid is the Statewide Comprehensive Outdoor Recreation Plan (SCORP). The SCORP is a broad document that provides a vision for recreation in New York State over a five year period. This plan encompasses the recreation industry in the entire state and reaches beyond the scope of the New York State Park System.

Within the recreational planning system, the Conserving Open Space in New York State plan, OPRHP's Fostering Environmental Stewardship report and the Land Classification System provide more specific policy directions to guide OPRHP's planning system. The "Open Space Plan" defines the needs and outlines some strategies for conserving open space lands. The plan was

devised through the cooperation of both the Department of Environmental Conservation (DEC) and the Office of Parks, Recreation, and Historic Preservation (OPRHP) as authorized under the provisions of section 49-0207 of the Environmental Conservation Law (NYS DEC and OPRHP, 1992).

The report, Fostering Environmental Stewardship, addresses the issue, not only, of the deterioration of the facilities and structures at state parks but also the loss and abuse of natural resources within the state parks. The "Stewardship Plan" provides a brief evaluation of the park system and lists over 100 management strategies and recommendations to "... inventory, assess, protect, or enhance the natural, cultural, scenic, and recreational resources of New York's system of state parks and historic sites" (NYS OPRHP, 1993).

The LCS categorizes the state parks according to the type of site (i.e. multipurpose, linear, historic or boat launch, etc.), the level of development, the purpose set forth in the enabling legislation, the available facility/activity development, and levels of use intensity. Under this system, similar state lands are grouped together. This approach allows for developing common management directives for lands of the same class. All of these components are used as a basis for developing OPRHP's Park System Plan. OPRHP's Park System Plan is a general plan that focuses on the entire park system and develops concepts, goals and objectives for the park classes.

OPRHP's Master Plans are park/site specific plans and will eventually use guidelines and management strategies identified in the Park System Plan. These plans define hands-on management actions that serve to satisfy the objectives, goals, concepts, and ultimately, the vision for recreation in New York State. Specific policies are identified, use and resource analysis is conducted, alternative management actions are considered and finally, a preferred alternative is selected.

The Capital Investment Plan outlines projects (i.e. the development or rehabilitation of facilities) that are scheduled to be started or completed within a five year time block. Ultimately, the public experiences the results of this planning system.

Land Classification System

The LCS has been a component of the New York State Parks Planning Process and the Statewide Comprehensive Outdoor Recreation Plan (SCORP) since its development in 1974. The proposed system uses various aspects of all OPRHP recreation lands such as level of development, physical capacity, environmental constraints, and other management related data, to identify appropriate activities and classify park types so that appropriate management directives can be developed.

The proposed LCS provides a more detailed and a clearer set of parameters for each classification. This includes the incorporation of new activities and facilities categories. Since every OPRHP park/site has distinctive features and a particular level of development, the categorization according to development intensity (High, Moderate, Low) introduces a new variable that is to be incorporated in the evaluation of each area. Also, two other activity indicators, "Allowed" and "Not Allowed", were added. The "Allowed" indicator permits the identification of activities that take place on parks/sites but do not require built facilities, while the "Not Allowed" level identifies activities that are expressly prohibited by either policy or legislation.

The system has been expanded to include new land categories: Underwater sites, Urban Cultural Parks, Interpretive areas and DEC land categories. Finally, within the revised classification system, the classification of each area is clearly identified. The classification represents the overall evaluation of the area based on natural/cultural resources, activities and facilities. The park/site may be zoned through the master planning process to reflect areas that require different types of management such as the identification of "preserve areas" within a park classified as a "Scenic" or "Recreation Park" (Figure 2).

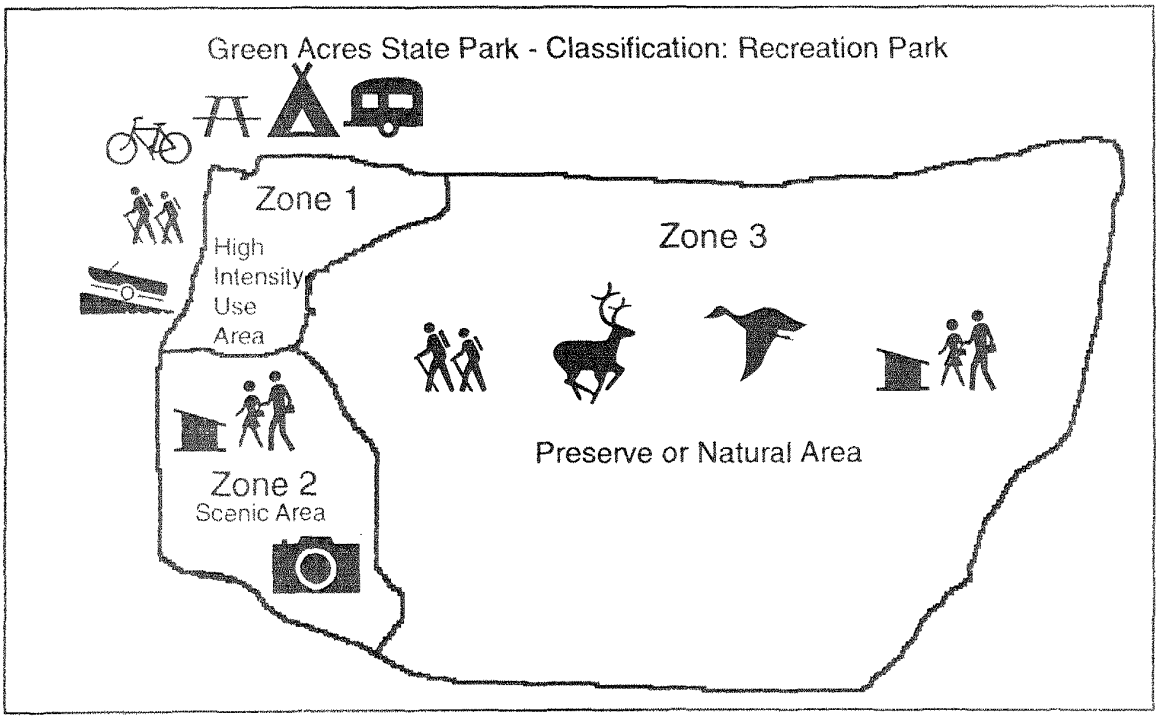


Figure 2. An example of park zoning.

Classification Framework:

The Conceptual Matrix

The initial classification system was based on natural resource, recreation facility and operational information that existed at the time of its development in 1974. The system is part of a dynamic process that evolves as the system is continuously refined and more information becomes available. The initial analysis grouped parks and sites with similar characteristics and provided a primary form of land capability analysis to ascertain what intensities of use a particular area or park can support (OPRHP, 1980). The 1974 classification system did not indicate areas where development should be totally prohibited or encouraged but did indicate the overall natural constraints faced in park development or management.

The proposed classification system is based on the combination of natural and cultural resources, the major types of recreational activities and facilities and the levels of development for each park. The progression from areas of intensive development to areas of limited development shows the importance of the ecological attributes and the vulnerability of the natural and historic resources offered by the different recreational units. Each cell of the conceptual matrix implies a particular management strategy that allows appropriate public use by setting specific developmental guidelines (Figure 3).

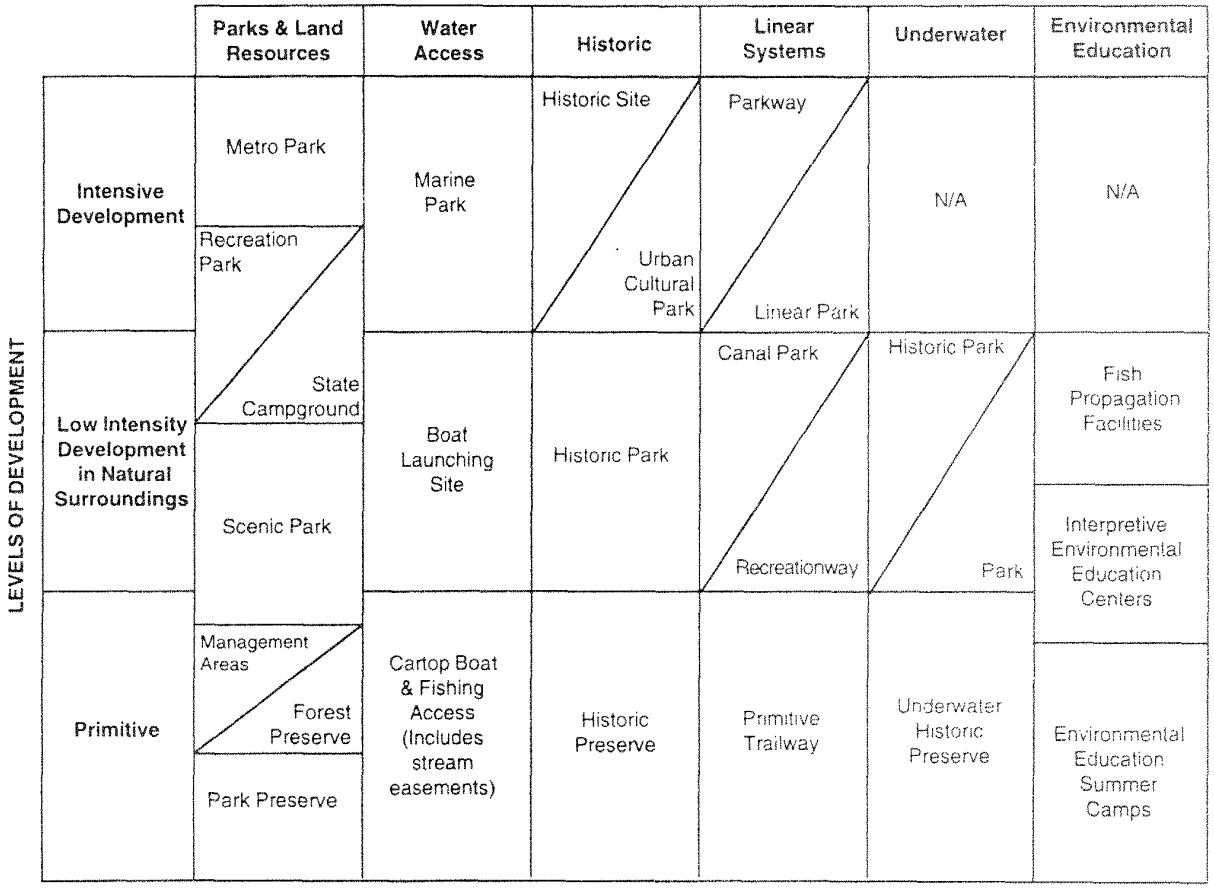


Figure 3. The conceptual classification matrix.

By combining the major types of recreational activities and the levels of development intensity for each park, the matrix describes park categories that are sufficiently similar to maintain relatively uniform management analyses of potentials and constraints.

The levels of development in which the state parks and recreation areas were classified remains the same as those used in the 1983 SCORP (OPRHP, 1983).

INTENSIVE DEVELOPMENT:	is associated with those properties compatible for high intensity, concentrated use. Facilities may be provided for indoor and outdoor activities; these and other man-made structures are predominant.
LOW INTENSITY DEVELOPMENT:	is associated with those properties that are developed at a relatively low intensity in such a way to allow public use in natural surroundings.
PRIMITIVE:	are those areas containing fragile ecological or cultural resources that must be protected through appropriate but limited public use.

Type of Activity/Facility
The proposed classification system also uses the existing four categories according to the type of activity/facility offered by the unit:

PARKS & LAND RESOURCES (P):	open space areas utilized in various degrees for recreation and environmental purposes.
BOATING (B):	facilities with a focus toward boating activities and its related uses.
HISTORIC (H):	site with historical significance that are primarily managed for cultural interpretation or preservation.
UNDERWATER:	aquatic areas of good water quality with geological and/or historical significance.
ENVIRONMENTAL EDUCATION (E):	sites having significant interpretive and educational potential, managed primarily for public visitation.
LINEAR SYSTEMS (R):	recreation ways, parkways, trails, movement corridors which link recreation, cultural or open space areas either to population centers or to other recreation/cultural areas.

To further refine the classification system, development levels were established for the activity/facility categories within each classification. The intensity levels include:

HIGH INTENSITY (H):	Areas or activities within the park/site which require extensive or a higher level of development of indoor/outdoor facilities and programs (i.e. swimming pool complexes, high use developed beach areas, band shells, court game areas, campsite development with full hookup and electric, marinas, etc.)
MODERATE INTENSITY (M):	Areas or activities within the park/site which require a moderate level of development of indoor/outdoor facilities and programs (i.e. smaller developed beach areas with basic supports facilities, campsite development with basic support facilities or paved boat launching sites).
LOW INTENSITY (L):	Areas or activities within a park/site which require no or a limited level of development of indoor/outdoor facilities (i.e. primitive campsites, natural beaches with limited support facilities or unimproved boat launching sites).
ALLOWED (A):	Activities that are low impact but may vary in type and level. There are no or limited developed and support facilities associated with the activity (i.e. hunting).
NOT ALLOWED (X):	Activities that have been specifically defined not to be permitted within a particular area.

Through an agency "Park Planning Steering Committee," comprised of park professionals from each of the regions and appropriate bureaus, the recreation activity criteria for each classification was clarified and revised. A list of activities along with a level of development measure was created. However, not all the activities identified for a classification may be appropriate or desired for a particular park or site (Figure 4).

Once the type of activity is combined with the level of development, 23 subcategories emerge in the proposed classification system. The gradient from high intensity development to low intensity development within each general categorization denotes a new improvement to the classification system. An example is shown in Figure 5. The system, however, does not reflect the intensity of use a particular area or facility may experience. For instance, a low intensity developed area such as a canoe access area may receive a high level of use as compared to a paved boat launch site which may experience a low level of use. This is a factor of location and attributes which attract people.

The land use criteria for the proposed system gives a brief description of each classification, an overall level of development and a breakdown of the number of acres in built areas, managed areas or undeveloped natural areas (Figure 5).

PARK CLASSIFICATION

ACTIVITY / FACILTIY	P-1	P-2	P-3	P-4	P-5	P-6	P-7	B-1	B-2	B-3	E-1	E-2	H-1	H-2	H-3	H-4	R-1	R-2	R-3	R-4	U-1	U-2	U-3
DAY USE																							
PICNIC	H	H	M	H	L	L	L	H	M	L	M	L	H	M	L	H	L				L	L	L
PLAYGROUND	H	H	M	M				M								H							
COURT	H	H	M	M												H							
FIELD	H	H	M	M				L								H							
GOLFING		H		H	L											H							
NON-MOTORIZED TRAILS																							
Hiking	H	H	H	H	L	L	M	L			M			M	M	H	M						
Biking recreational	H	H	M	H	L	L	L	L						L	L	H	M	M	M	L			
mountain		H	M	M	L	L	L									H	M	M	M	L			
Nature	H	H	H	H	L	L	H	L			M					H	M	M	M	L			
Equestrian		H	M	H	L	L	L							M	L		M	M	M	L			
Horse Carriages		H	M	H			L									L	M	M	M	L			
MOTORIZED TRAIL																							
ATV					X												L	L	L				
Trail bikes					L/X												L	L	L				
4WD					L/X																		
ROCK CLIMBING		A	A	A	A		A																
HUNTING		A	A	A	A	A	A				X	X											

Figure 4. The compatible activities/facilities matrix.

Applying the Land Classification System

The existing park and site classifications were then reevaluated using professional staff knowledge of each park and site. Based on the revised activity and land use criteria, several parks were reclassified. Some parks were reclassified in a classification that allows a higher level of development, while others received classifications that permitted lower levels of development. In most cases, the acreage of land uses and the significance and level of protection of a park's natural and cultural resources did not change. The system and individual park and site classifications will continually undergo additional refinements through the master planning process and as more natural and cultural resource information is developed.

The Park Steering Committee identified additional options to be considered in the further refinement of the system. The proposed system is based on a single classification for a park or site. An alternative would be to have a dual classification system in which there would be separate classifications for natural and cultural resources and recreation resources. This would provide additional guidance in land use, development and management decisions and strengthen the concept of establishing zones within parks and sites.

The central concept of the classification system lies in the progression from classification of park/site types and the identification of functions to the specification of appropriate management practices. The classification system is intended to provide direction and guidance for making land use decisions while retaining the flexibility to permit individual evaluation in specific park/site sub-zones. It is recognized that good planning and environmental review principles must remain in force relative to these issues. The system is intended to support such rational planning and environmental assessment activity, not preclude it.

In the ultimate application of the entire classification system, "gray" areas will always exist. This is due to the uniqueness and the character of each park and site. Even though the classification system will provide overall guidance, individual consideration for the determination of development, protection and management will occur at the park and site level.

The updating process of the Land Classification System responds to the necessity of getting more detailed information of the natural and cultural resources statewide and under OPRHP's responsibility. As more detailed information is developed, the classification of the recreational units can be accurately reevaluated.

		USE CHARACTERISTICS			
PLANNING CATEGORY	RESOURCE CHARACTERISTICS	DESIGNED LEVEL OF USE	% BUILT AREAS	% MANAGED AREAS*	% UNDEVELOPED NATURAL AREAS
METRO PARKS P-1	Located in urban, industrial or suburban surroundings with man-made architectural treatment of the environment.	High	0 to 75	25	0 to 75
RECREATION PARK P-2	Natural surroundings in suburban or rural areas. A mix of natural and developed areas, significant natural areas not essential.	High	0 to 15	0 to 100	0 to 100
STATE CAMPGROUNDS P-3	Primarily in rural setting. A mix of natural and developed areas, significant natural areas not essential.	Moderate	0 to 10	0 to 80	20 to 100
SCENIC PARKS P-4	Natural setting, limited development, scenic attractions within urban, suburban or rural areas. A mix of natural and developed areas with significant scenic features.	High	0 to 5	0 to 50	50 to 100
MANAGEMENT AREAS P-5	Primarily wooded or wetland areas; rural natural setting; limited or no development; offers significant recreation and wildlife observation opportunities.	Low	0 to 15	0 to 5	85 to 100
FOREST PRESERVE P-6	Natural, forested areas; low to moderate development of facilties usually related to compatible activities; recreation opportunities range from low-impact, wilderness activities to limited motorized activity	Low	0 to 5	0 to 5	95 to 100
PARK PRESERVES P-7	Natural areas, few developed facilities within urban, suburban or rural areas. Could have salt marshes, wetlands, bogs, dunes, unusually steep topography, flood prone areas, or other significant environmental resources.	Low	0 to 5	0 to 15	85 to 100

Figure 5. Land use criteria for the proposed land classification system.

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PEOPLE'S PERCEPTIONS OF MANAGED AND NATURAL LANDSCAPES

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Research was undertaken to identify the opinions of what people saw in slides of managed and unmanaged landscapes. Most people were attracted by natural landscape features. Clearcuts were reported less frequently than roads, but dislike of them was more than 30 percent greater. Natural openings, bare areas, and sparse tree cover also were disliked.

Introduction

Visitors to wildland areas of the United States see an untold variety of natural and manmade features that comprise our National landscape. But, what do they really see, and do they express their feelings about their perceptions in some meaningful way? People reportedly endow meaning to landscapes (Lynch 1960; Lee 1976). Landscape architect Garrett Eckbo (1969) said, "the physical landscape is visual; the social landscape is verbal." Thus, it is through words that people express what landscapes mean to them and their concern for what is seen. Verbal expressions of what people see in landscapes provide not only clues to the meanings they assign to landscapes, but also their concern for management and its influence on visual quality. Thus, verbal expression may offer managers indicators of how the public may react to natural resource management and suggest management alternatives that are sensitive to the desires of the viewing public.

Efforts to assess public perceptions and concerns about the landscape and its management led to the development of sensitivity levels in the Visual Management System used by the Forest Service to plan management within visual constraints. Presumably, sensitivity levels measure viewer interest in the scenic quality of landscapes by determining the frequency of visitor travel along highways. However, counting people cannot be construed as an expression of public interest or concern for what may have been seen in landscapes.

A study, completed in 1989, was designed to provide some measure of public sensitivity or concern for landscapes and their management. One objective was to identify distance thresholds at which objects of a know size could be detected and identified (Magill 1990). In addition, opinions were sought about objects and management actions that people saw as indicators of concern for landscapes or to suggest how to develop such indicators (Magill 1992). This paper describes people's perceptions and opinions about natural and managed landscapes.

Methods

Respondents were shown color slide sets of various landscape components, structures, and management actions from throughout the western United States. Slides were randomly distributed into 8 slide shows of 30 slides each. During shows, respondents completed a questionnaire providing brief descriptions of the two objects, in order of importance to them, that attracted their attention in the slides. Also, they indicated whether they liked, disliked, or were indifferent to the objects seen. Thus, all objects reported by respondents were natural objects, manmade objects, or management actions that included trees, forests, cuttings, clearings, and regeneration of trees.

Results and Discussion

The majority of respondents were long-term suburban residents of primarily California. Forty-one percent of them were professionally trained persons and another 29 percent were retirees. Eighty percent had attended college, and 73 percent had family gross annual incomes of $25,000 or more. Two-thirds of the respondents were male, and most recreated on wildland areas 3 to 10 times per year.

The 788 respondents reported seeing 154 objects or conditions as being most important to them in the slides of managed and unmanaged areas. Among the objects were 30 vegetative conditions such as brush, forest stands, woodlands, forest groves, tree growth, sick trees, and vegetation.

According to psychologist M.D. Vernon (1968), people tend to focus attention on things having the greatest interest or importance to them while things of lesser interest are seen only peripherally. People also tend to be more interested in and assign more importance to natural landscape elements, such as forest stands and mountain ranges and peaks, in contrast with various management actions like roads and clearcuts (Magill 1990). These conclusions were fortified by analysis of specific terms used by respondents to describe the two most important objects or conditions they saw. Most people, in this study, were attracted by natural landscape objects seen in slides, regardless of management or lack of it. And, 79 percent of the responses were concerned with various combinations of trees, hills, valleys, mountains, vegetation, and other objects descriptive of natural landscape conditions.

Forest Stands and Trees

Foremost among the favored landscape elements were "forest stands," which accounted for nearly 13 percent of the responses for scenes of managed and unmanaged landscapes. Forest stands were reported nearly 40 percent more frequently than any other natural object, and 81 percent of the responses indicated that they were liked. Forest stands contributed 23 percent of the responses associated with viewing scenes of regeneration, and 82 percent of those responses indicated that viewers liked the regenerating forests. For such sites, forest stands likely were reported in lieu of regeneration--probably because the term, "regeneration," may not be meaningful to most respondents. When the terms, "valleys," "hills," "mountains," or "peaks," were modified by forested, the locations that were described were liked more than other locations described by the unmodified terms. Clearly, forests are important visual components of our landscapes.

Bare Areas and Brush Clearings

"Bare areas" rated among the 10 most frequently reported natural landscape elements, and according to a majority of responses (61 pct), they were disliked. As might be expected, "barren valleys," "bare hills," "bare mountains," and "bare peaks" were also disliked. Yet, if any of these features were described as forested, grassy, or green, they were liked. Two vegetative conditions may be related to perceptions of bareness. Landscapes that were reported as having either "no vegetation" or "no trees" also were disliked even more than bare areas. Apparently the respondents preferred seeing landscapes that supported trees or some other type of vegetation. Moreover, they disliked "sparse forests" (42 pct), "sparse vegetation" (53 pct), or "even-sized trees" (72 pct), while they preferred "green vegetation" (86 pct), "green valleys" (81 pct), "green hills" (80 pct), and "green mountains" (85 pct).

People saw brush clearings, done to favor tree growth, as "bare areas" or "clearcuts." In all likelihood, the activities were not identified as "brush clearings," because respondents may have been unfamiliar with that type of land management and with the terminology used to describe it. Similar arguments could be applied to type conversions for livestock or wildlife habitat improvement and to tree regeneration after timber harvesting, brush clearing, or burns. These misinterpretations suggest that better public understanding of natural resource management is needed. Gaining understanding may best be done by listening to people, learning how they want their resources managed, then

adapting management, if possible, for the benefit of the people and the resources. Accomplishing the job may not be easy. Resource managers have been reported to have difficulty with public interactions including a tendency to seek a change in public opinion, but not in their own management practices (Magill 1988).

Tree Regeneration

Tree regeneration after timber harvesting was the subject of several scenes. Regeneration was the last of the 20 objects most frequently reported by respondents. People reported seeing "growth," "new growth," "tree growth," "young trees," "plantations," "farms" or "ranches," and "pastures." Any of these could be descriptive of regeneration, and all were liked. In general, most people looked at scenes of regeneration, but they reported seeing "forest stands."

Many areas that were fully stocked with regeneration were described as "clearcuts," "cuttings," "bare areas," and "logging"--all terms accurately described the sites being viewed. Either the respondents were unable to recognize the regeneration on such areas, or they simply failed to mention it. Regardless, when such scenes were perceived to involve timber harvesting, most were disliked (60 pct).

"Snags" and "dead trees" accounted for 5 percent of the responses of those who viewed scenes of regeneration, but opinions were equally divided between liking and not liking them. Those that liked the snags and dead trees were among the members of professional societies and various conservation organizations. On the other hand, members of sportsmen's clubs and industrial associations tended to dislike dead trees and snags. Possibly, they associated them with fire prevention messages that identify snags and dead trees as contributors to the spread of wildfires, whereas the other groups saw them as beneficial to wildlife.

Clearcutting and Other Timber Harvesting

Despite the public debate about management versus environmental protection on public lands in the United States, only two management actions were reported among the 22 most frequently reported objects for scenes of managed landscapes (Table 1). On lands where timber harvesting was in progress, "forest stands," "mountain ranges," "dome peaks," "meadows," "hills," and "bare areas" were reported even more frequently than clearcuts. However, in combination, "clearcuts," "cuttings," "clearings," "selection cuts," "partial cuts," "regeneration cuts," and "shelterwood cuts" accounted for a total of 6 percent of all objects reported on timberlands. The frequency of response was negligible for the last four cutting types. "Timber cuttings," unspecified as to type of cutting, were disliked, according to 64 percent of the responses, and "clearings," either tree cuttings or brush clearings, were disliked according to 51 percent.

Table 1--The objects most frequently reported for managed landscape and opinions of them.

	Opinions of Objects Reported					
	Liked		Disliked		Indifferent	
Objects Reported	Percent	(n)	Percent	(n)	Percent	(n)
Forest stands	81.2	(3500)	3.3	(144)	10.0	(431)
Mountain ranges	78.3	(1999)	2.8	(71)	13.7	(349)
Dome peaks	78.8	(1791)	4.0	(90)	12.9	(292)
Roads	21.1	(391)	42.7	(791)	30.8	(570)
Hills	64.9	(927)	7.7	(110)	21.5	(307)
Meadows	72.3	(690)	6.8	(65)	16.4	(157)
Bare areas	11.0	(104)	61.5	(582)	22.0	(208)
Brush	46.9	(409)	17.8	(155)	30.0	(262)
Clearcuts	9.3	(77)	75.7	(630)	12.7	(106)
Color contrasts	68.8	(487)	12.1	(86)	14.1	(100)
Rocks	69.1	(447)	6.8	(44)	19.6	(127)
Lakes	88.6	(544)	1.8	(11)	4.4	(27)

Some managers may be surprised to learn that "clearcuts" were second to "roads" as the most frequently mentioned type of landscape management, especially considering the number of appeals and law suits concerned with timber harvesting. Furthermore, clearcuts were not the management action that was most disliked, though they were more frequently mentioned than the other actions that were disliked more (Table 2). Dislike of "overgrazing" and "poor management" was 10 percent greater than for clearcutting. Also, respondents reported seeing "cuttings," "logging," and "clearings" after viewing scenes that actually contained clearcuts, but the frequency of responses was much less than for clearcuts as was the percentage that disliked them. Nevertheless, clearcuts accounted for over 3 percent of the responses for areas subject to timber harvesting, and 67 percent of the responses indicated clearcuts were disliked.

Table 2--Opinions of management objects on managed landscapes (ordered from most to least disliked)

	Opinions of Objects Reported					
	Liked		Disliked		Indifferent	
Objects Reported	Percent	(n)	Percent	(n)	Percent	(n)
Overgrazing	2.0	(1)	89.9	(44)	4.1	(2)
Poorly managed	11.4	(5)	86.4	(38)	2.3	(1)
Clearcuts	9.3	(77)	75.7	(630)	12.7	(106)
Powerlines	4.1	(10)	68.9	(166)	20.7	(50)
Cuttings	11.5	(33)	68.3	(196)	16.0	(46)
Smoke or smog	14.5	(22)	67.8	(103)	9.2	(14)
Logging	16.8	(38)	61.9	(140)	11.9	(27)
Mircowave towers	7.1	(14)	59.7	(117)	28.6	(56)
Clearings	14.0	(34)	55.4	(134)	26.0	(63)
Mines	14.8	(18)	51.6	(63)	18.0	(22)
Ski areas	25.5	(51)	45.5	(91)	27.0	(54)
Roads	21.1	(391)	42.7	(791)	30.8	(570)

The intensity with which clearcuts were disliked was emphasized by respondents who reported seeing "clearcuts" in natural or unmanaged areas. However, the information collected did not identify specifically what was perceived as clearcuts. The size of whatever was seen possibly was small enough to have prevented accurate discrimination. Also, people may have reported various cuttings and clearings because their attention was attracted to natural openings, bare areas, or sparse tree cover that led them to report what they expected to see rather than what was seen (Vernon 1968). Regardless, reports of disliking clearcuts were 17 percent greater when people saw scenes of natural areas as contrasted with scenes of timber harvesting.

Membership in different social groups provided some insight into who liked or disliked clearcuts. Fifteen percent of the responses for timber harvest areas indicated a liking of clearcuts predominantly associated with people belonging to professional societies, industrial associations, and the unaffiliated. Fifty-three percent of the responses showed that members of industrial associations liked the scenes of clearcuts, while only 20 percent or less indicated that members of professional societies or the unaffiliated liked clearcuts. The strongest disliking, over 80 percent of the responses, was expressed by members of influential conservation groups. Even though a few members of sportsmen's clubs indicated a liking for clearcuts, most responses (72 pct) showed nearly as much opposition as among conservation groups.

The unfavorable reactions to clearcuts or things perceived as clearcuts are in harmony with numerous appeals of forest plans and injunctions against logging that reflect public disenchantment with clearcutting. One might contend the data are too provincial to merit comparison with a nationwide public issue. However, the dislike associated with clearcutting, in this study, came from persons who viewed numerous scenes of clearcuts located in the States of California, Idaho, Montana, Oregon, and Washington. All are locations within the heart of the present timber controversy. Thus, the findings seem to support warnings that change in forest management is needed in the United States. Change is manifesting now as "ecosystem management," which is suppose to couch forest management in scientifically supported ecological principles at the landscape level. Thus, it is expected to create sustainable forests while providing a full range of tangible and intangible benefits. At this stage, according to Assistant Secretary of Agriculture James R. Lyons, ecosystem management may be "more art than science" (1993). While, it is gaining the support of many people, others view it with skepticism.

This paper described a different approach for evaluating public perceptions and opinions of managed landscapes. It told what a segment of the public saw in color slides of managed and unmanaged landscapes and identified what the respondents liked and disliked about the scenes. Thus, it provides support for some opinions managers may have had about public reaction to the negative influence of various land management actions. Ideally, the approach will provide managers with better understanding of public concerns for the visual impact of resource management practices on wild landscapes and make management more visually sensitive to public desires.

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THE RELATIONSHIP OF RECREATION SPECIALIZATION TO THE SETTING PREFERENCES OF MOUNTAIN BICYCLISTS.

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This study gathered information about mountain bike use and users on unpaved trails in a Raleigh, North Carolina park. Specifically, it attempted to determine if levels of recreation specialization were related to the setting preferences of mountain bike users. The results offered partial support for the existence of a relationship between recreation specialization and preferences for various setting attributes.

Introduction

This study examined the setting preferences of mountain bikers for various off-road trail features. Specifically, this research looked at the different setting preferences reported by mountain bikers of different levels of activity specialization (Bryan, 1977 & 1979). Many different types of off-road trails are currently used by mountain bikers. Land managers and recreational planners, however, have limited knowledge of why mountain bikers choose to ride where they do. To understand why riders prefer certain trails, it is important to better understand their choices for various settings. With knowledge of these preferences, land managers will be better able to serve participants of this growing activity.

The increased popularity of mountain bikes has led to a greater presence of cyclists on unpaved trails and in backcountry areas. Near urban areas, cyclists often use local parks and undeveloped tracts of land for their off-road riding. The managers of these urban and suburban areas, however, are often wary of the presence of mountain bikers. Their cautiousness stems, in part, from fears that mountain bike use will increase user conflicts, erosion, and resource damage. These fears seem to be particularly pronounced near urban areas because parks and open spaces there are often heavily used. These fears and heavy use have led to many areas being closed to mountain bike use.

Lake Johnson Park in Raleigh, North Carolina is an example of an urban/suburban park that has become popular with mountain bikers. The 463 acre park is only 3 miles from North Carolina State University and has several large apartment complexes, numerous private homes, and a high school on its borders. It contains a combination of approximately seven miles of paved and unpaved trails which parallel the shore of a 148 acre lake. The trails most often used by mountain bikers are unpaved and lie along the southern edge of the lake. These trails offer bikers a variety of challenging rides that are easily accessible. However, the Raleigh Parks and Recreation Department has plans to pave certain trails presently popular with mountain bikers and is considering closing the unpaved trails in the park to mountain bike use.

The closure of Lake Johnson Park's unpaved trails to mountain bikers would displace these users to other areas, some of which already have or are considering having restrictions on mountain biking. The Raleigh Parks and Recreation Department is aware of this fact, and is considering designating alternative areas for mountain bike use. At the present time, however, no research exists which identifies the preferences for various site attributes among mountain bike riders. The lack of such information poses a problem, as managers are not sure what types of areas would be most attractive to mountain bikers and how to best design the trails in those areas. If managers did know which specific site attributes were preferred by mountain bikers, areas which meet the needs of these users could be provided. If such areas were provided, the mountain bike community might be more inclined to obey restrictions and accept closures elsewhere. Previous research, however, indicates that participants in a recreational activity, are not homogeneous (Shafer, 1969). All mountain bikers are not likely to prefer the same settings for their riding. One variable that has been found to be related to setting preferences among recreationists is activity specialization (Williams and Huffman, 1986; Ewert 1985; Virden and Schreyer, 1988). If recreation specialization is related to the setting preferences of mountain bikers, such information would be an important consideration for planners attempting to provide suitable locations for mountain biking.

Related Literature

Mountain biking began in the mid 1970's in the hills of Marin County, California. Early riders started with beach cruisers and began to add components from road bikes. By adding multiple gears, wider tires, and cantilever brakes to beach cruisers, early mountain bikers found they could ride on the dirt roads and trails in the area. In 1982, the Specialized bicycle company introduced the Stumpjumper mountain bike, the first production mountain bike ever sold. With the introduction of this new bicycle, a new sport was introduced to the masses (Ker, 1991). Since that time, the number of mountain bike riders in the United States has risen to an estimated 25 million in 1992. Mountain bikes have become so popular that they now represent 81% of all bicycles sold in this country (National Off-Road Bicycle Association, 1992). The tremendous increase in popularity of this sport since the mid-70's has generated new challenges for land managers.

Unlike other outdoor recreation activities such as boating, hiking, and fishing, mountain biking has received little research attention. Existing studies have focused on backcountry areas and tended to examine user conflicts involving mountain bikers or resource impacts caused by mountain bikes. For example, two USDA Forest Service studies examined safety concerns related to mountain biking on the Santa Barbara Front trails in California. As part of the study, meetings were held with representatives from four primary user groups of the trails: hikers, equestrians, mountain bikers, and Sierra Club members. Although various problems and solutions were discussed, none were agreed upon. A subsequent survey of the users of the Front trails led researchers to recommended that no action needed to be taken with regard to limiting mountain bike access. Instead, they suggested that managers improve safety for trail users through increased signage and user education. Both studies also showed no increases in trail erosion rates due to mountain bikes (USDA Forest Service, 1987 & 1989).

A study by Seney (1990) on the relative impacts of hiker, horse, mountain bike and motorcycle use on trails showed that trail damage by mountain bikers was not significant. In a preliminary study on the effects of mountain bike, foot, and horse traffic on exposed soil and soil compaction, McEween (1992) concluded that horse and mountain bike traffic appeared to show higher patterns of erosion than those of hikers in Ohio's Shawnee National Forest. The study also found that the impacts of horses and mountain bikes appeared to be very similar. Watson, Williams and Daigle (1991) looked at the extent of conflict between mountain bikers and hikers in the Rattlesnake National Recreation Area near Missoula, Montana. They compared hikers and bicyclists in terms of environmental meaning, perceptions of similarity, and conflict. The findings indicated that hikers generally expressed greater feelings of conflict than bicyclists. The conflict expressed, however, did not always affect

recreational experience or lead to specification of objectionable behavior. The findings did suggest that techniques, such as user education, could be used to reduce conflicts among area users. They found that cyclists considered themselves more similar to hikers than vice versa and suggested that this might be due to the fact that some bicyclists saw themselves as hikers who were using bicycles to gain quicker access to backcountry areas. The study also speculated that less specialized bicycle riders and hikers did not go into certain areas of the Rattlesnake National Recreation Area until they had developed a higher level of specialization and, therefore, a greater appreciation for the environment.

Most recently, Hollenhorst, Schuett & Olsen (1993) examined the characteristics, preferences, and attitudes of mountain bikers using national forests in West Virginia, California, and Texas. Data for the project was gathered using on-site surveys and focus group interviews. They found that mountain bikers in the national forests tended to be young, highly educated, affluent males from urban areas. "Mountain bikers overwhelmingly preferred off-road conditions, spending approximately 68% of their time on trails and abandoned roads" according to the authors (p. 26). A majority (66%) of respondents were day visitors and many reported participating in related activities such as day hiking, car camping, backpacking, and photography while visiting national forests. Mountain biker's attitudes and preferences were also examined. Although riders expressed an interest in taking chances, they did not perceive mountain biking to be dangerous. The three top reasons for mountain biking were found to be: Enjoyment/Fun/Love it; Physical/Exercise; and Nature/ Environment. Access, impacts, and conflict were the most important issues and problems facing mountain biking in National Forests according to those surveyed.

The need for research on the characteristics of mountain bikers, conflicts with other users, commercial opportunities, and community development potential resulting from bicyclists has been recognized by two different USDA Forest Service Research Stations (Magill, 1992). These stations are currently beginning research which they hope will provide managers with information to guide planning and decision making regarding mountain biking. However, no past research has focused on urban or suburban mountain biking areas and very little is known about which site attributes mountain bikers prefer.

Methods

A combination of on-site interviews and follow-up mail surveys were used to gather data for this study. Data collection took place during the months of January, February, and March, 1993. The data was collected during systematically scheduled trips of park trails designed to represent different times of day and all days of the week. One trip around the lake was made during scheduled weekdays and two trips (one morning and one afternoon) were made on scheduled weekend days to capture the far heavier use that occurred on weekends. During each trip, interviewers on mountain bikes attempted to intercept and interview every mountain biker on the unpaved trails. Interviews took approximately two minutes each and were used to gather basic use information and to acquire the user's name and address so a follow-up mail survey could be sent. A total of 54 interview trips around the lake were conducted. Each person interviewed was sent a copy of the mail survey within five days of their visit. A slightly modified Dillman approach was used which incorporated two follow-up mailings to nonrespondents (Dillman, 1978).

Level of activity specialization was the independent variable for this study. A series of five questions were asked related to this concept. These questions were: "How long have you been riding Mt. Bikes?," "How many times in the last 12 months did you ride your Mt. Bike off-road?," "When you ride your Mt. Bike off-road how long do you usually ride?," and "About how much is your mountain bike(s) and all your mountain bike equipment worth? (Please include all your mountain bike gear e.g., pump, helmet, car rack, clothes, etc.)." The fifth question asked "How would you rate yourself as a participant in the sport of Mt. Biking?" and was rated on a seven-point Likert-type scale where "1" indicated "novice" and "7" indicated "expert." An additive index of activity specialization for mountain biking was created from these five questions by standardizing the responses to each using Z-score transformations (Virden, 1986). These Z-scores were then summed to form an index score for each respondent.

Mountain bikers' preferences for various setting attributes were used as the dependent variables for analyses. Preferences were operationalized by asking respondents to rate the desirability of various trail attributes in the mail questionnaire. They were asked, "Listed below are some of the characteristics that many people consider desirable for trails. Please consider each characteristic and circle the number that best indicates how desirable or undesirable it is to you when you select a place to ride." A list including 18 physical trail setting characteristics followed. After each attribute there was a nine point Likert-type scale ranging from "1" for "extremely undesirable" to "9" for "extremely desirable." The eighteen physical attributes to be examined were identified through interviews with members of local mountain bike organizations. These attributes included: "winding trail," "hills," "fast downhill sections," "natural surroundings," "technical sections," "single track trails," "rolling/undulating sections," "long distance," "technical descents," "log crossings/ obstacles", "creek crossings", "rocky sections", "loop trails," "muddy sections," "bridge crossings," "long straight sections," "level grades," and "smooth trail surfaces." Descriptive statistics were used to describe the characteristics of mountain bikers surveyed and their preferences. Correlation analyses were used to examine the relationships between activity specialization and the preferences for each of the setting attributes.

Results

A total of 141 mountain bikers were interviewed along the trails. Five users were under 16 years of age and were not mailed written questionnaires. Of the 136 mountain bikers who received mailed questionnaires, 102 (75%) responded. The characteristics of these users and their trail use are summarized in Table 1. In general, the mountain bike users of Lake Johnson Park were young, male, college-aged students who lived near the park. These users visited the unpaved trails approximately every week for about two hours and reported that convenience, closeness, and challenge were the main reasons for riding there. The users were predominantly single with incomes under $20,000 and most rode their bikes from their homes to the park.

Table 1. Characteristics of trail users.

Young males (mean age 23.2)
Average household income of less than $20,000
Marital status = single
Ride at park frequently (mean 35.3 times in 12 months)
Average ride time of 2 hours
Live between 1 - 3 miles from the park.
Occupation = student

In terms of activity specialization, the mountain bikers surveyed were varied. Most respondents were relatively new to the sport of mountain biking with an average of just over two years experience. Over 50% of the respondents had been riding mountain bikes for 24 months or less. There was a group (8.8%) of respondents, however, who had been riding mountain bikes for more than five years. In terms of self-rated skill, almost half (49%) of respondents rated themselves as above an intermediate level (> 4) on a 7-point scale. The average skill level of the respondents was 4.2, while the level of skill most frequently reported was 5 (38.2%). Only 5 (4.9%) respondents rated themselves as novices. On average the respondents reported that they had been mountain biking 68.6 times in the past twelve months. This represents more than one ride per week. All respondents reported that they rode for at least one hour every time they went mountain biking. The average time spent riding was over two hours (128.6 minutes) per outing. Only 6.0% of the respondents stated that they rode for three and a half hours or longer. The average dollar value of respondent's bike(s) and

equipment was $1127.45. The highest value reported was $7500. The responses to the above 5 questions were combined into an index to serve as the study independent variable. The resulting index had relatively high internal consistency as indicated by a Standardized Cronbach's Alpha reliability coefficient of .71 (see Table 2). After Z-score transformation to control for differences in the ranges and units of each question, the Z-scores were added to form the final index of activity specialization. The index ranged from -7.06 to 11.60. The mean value for the specialization index was 0.02.

Table 2. Reliability analysis for activity specialization index.

Specialization Item	Item Mean (n=99)	Corrected Standard Deviation	Alpha Item-Total Correlation	If Item Deleted
Months of mountain bike riding experience	28.6	22.7	.46	.66
Self-rated skill level[1]	4.2	1.2	.58	.61
Rides taken in past 12 months	68.6	61.8	.52	.63
Duration of average ride in minutes	128.6	45.7	.32	.71
Dollar value of equipment	$1,127.45	$1,017.48	.44	.67
Standardized Item Alpha (Total Index)				.71

[1] Mean calculated based on categories of "Novice 1" (coded "1") through "Expert 7" (coded "7")

Respondents' preferences for each of 18 trail setting attributes were the study dependent variables and were measured on a 9-point scale where "1" was "extremely undesirable" and "9" was "extremely desirable." The 18 features are shown in order of decreasing preference in Table 3. All trail attributes which received a mean score greater than "5" on the 9-point scale were classified as "desirable" while those attributes with means less than "5" were considered "undesirable." When ranked, 15 of the 18 trail attributes were found to be desirable and the remaining 3 undesirable.

The most desirable trail attribute according to respondents was the presence of "winding trail" with a mean score of 8.1. "hills," "fast downhill sections," and "natural surroundings" all received means scores of 7.9, indicating that these features were very desirable as well. The respondents rated features such as "log crossings/obstacles," "creek crossings," "rocky sections," and "muddy sections" as somewhat less desirable with scores ranging between 7.1 and 6.1. The only feature which drew a near neutral (5) response was "bridge crossings" with a mean of 5.5. The three features which received undesirable scores (means < 5) from the respondents were, "long straight sections," "level grades," and "smooth trail surfaces." These features received mean scores of 4.4, 4.3, and 4.2, respectively. Features that described the technical aspects of the trail ("technical descents," "creek crossings," "rocky sections," "log crossings," etc.) were ranked lower than features describing the trail itself ("winding trail," "hills," "natural surroundings," "single track," etc.).

The purpose of this study was to determine if there was a relationship between the level of activity specialization and the preferences for various setting attributes among mountain bikers. This relationship was examined separately for each of the 18 attributes using correlation analyses. The results of these analyses are presented in Table 3. Level of specialization was significantly (.05 level) related to preferences for six of the trail attributes. Specialization was positively and significantly related to preferences for "fast downhill sections," "technical sections," "single track trails," "technical descents," and "log crossings/ obstacles." Preferences for "level grades" were negatively and significantly related to level specialization. The relationship of specialization and preferences for "muddy sections" was also negative and approached significance (p =.054).

Discussion

This study found substantial mountain bike use at Lake Johnson Park. The finding that most users were young, male, college-aged students who lived near the park was not surprising. However the finding that users visited the unpaved trails more than once a week on average was not expected. It appears that the heavy mountain bike use at this park is due more to a small core of heavy users than to a large population of infrequent visitors.

The preferences for the various setting attributes provided an interesting look at the likes and dislikes of mountain bikers. Winding trails, with a mean score of 8.1 on a 9-point scale, was the feature Lake Johnson Park mountain bikers preferred the most. The thrill of turning and constantly changing direction seemed to be very appealing. At Lake Johnson Park, the unpaved trails wind constantly along the lake's shore, in and out of trees, and up and down hills. "Hills," "fast downhill sections," and "natural surroundings" were nearly as desirable (7.9) for riders at the park.

When a trail winds and is characterized by as many obstacles and challenges as the unpaved trails at Lake Johnson Park, the abilities of even the most skilled riders are tested. The specialized riders at Lake Johnson Park also seemed to prefer the challenge and convenience of the park. This preference for challenging areas helps explain why "single track trails", which are narrow one lane paths, were rated so high (7.6). "Single track trails" typically contain features such as "hills," "technical sections," and "fast downhills," which, when combined with "winding trails," definitely provide specialized riders with the type of terrain which challenges and tests their skills. As mountain bikers become more skilled, the ability to handle varying terrain increases. This fact was supported by responses to open-ended questions about why the respondents ride mountain bikes and why they ride at Lake Johnson Park. The responses to both these questions indicated that challenge was important. Additionally, Lake Johnson Park provides challenging terrain which is conveniently located. Significantly, the only other local areas (Falls Lake and Schenck Forest) which provided these types of desirable features have been closed to mountain bikers.

Table 3. Preferences for trail attributes and Pearson correlation coefficients between the specialization index score and the importance of trail attributes.

Attributes	Mean[1] Preference Score	Standard Deviation	Two-tailed Pearson r	probability	*n*
Desirable Attributes [2]					
Winding Trail	8.1	0.9	.149	.150	101
Hills	7.9	1.2	.179	.082	101
Fast Downhill Sections	7.9	1.3	.312	.002	101
Natural Surroundings	7.9	1.4	.044	.670	101
Technical Sections	7.8	1.3	.298	.004	101
Single Track Trails	7.6	1.6	.391	.000	101
Rolling/Undulating Sections	7.5	1.2	.039	.710	101
Long Distance	7.4	1.3	.141	.174	101
Technical Descents	7.4	1.5	.353	.000	101
Log Crossings/Obstacles	7.1	1.8	.249	.014	101
Creek Crossings	7.0	1.	-.097	.350	101
Rocky Sections	6.8	1.7	.013	.900	101
Loop Trails	6.7	1.8	.001	.990	100
Muddy Sections	6.1	2.4	-.199	.054	101
Bridge Crossings	5.5	1.6	-.067	.516	100
Undesirable Attributes [2]					
Long Straight Sections	4.4	1.9	.057	.582	101
Level Grades	4.3	1.8	-.233	.030	100
Smooth Trail Surfaces	4.2	2.0	.184	.074	101

[1] Means calculated using categories of "Extremely Undesirable 1" (coded "1") through "Extremely Desirable 9" (coded "9").

[2] Items with ratings > 5 on the scale were considered desirable and those < 5, undesirable.

Riders at Lake Johnson Park rated natural surroundings as highly desirable. The unpaved trails at the park are scenic, passing through the most beautiful sections of the park with striking views of the lake. This type of setting is rare in such urban surroundings. The preference for riding in natural surroundings is consistent with previous research (Watson, Williams, and Daigle, 1991) which suggests that mountain bikers often seek the same opportunities to enjoy backcountry areas as hikers do. Many mountain bikers appear to be looking for remote natural areas in which to enjoy their chosen activity. The unpaved trail at Lake Johnson Park definitely has all of the features which riders reported to be most desirable. The park's unpaved trails are characterized by a winding single track trail with hills and various technical sections such as "log crossings," "rocks," "logs" and "mud." In addition, all of this is found in a conveniently located natural setting along the edge of the lake.

The three features which mountain bikers considered undesirable on average, were "long straight sections," "level grades," and "smooth trail surfaces." These three features typically describe areas such as forest access roads and non-technical bike trails. Areas for mountain biking which are characterized by these undesirable features generally provide little challenge to riders. Lake Johnson riders seemed to be looking for a challenge. This fact was supported by the responses to the open-ended question about why respondents mountain biked. In their responses, respondents reported that challenge was an important reason for riding off-road. This was consistent with the findings of Hollenhorst et al., (1993). This apparently contributed to specialized mountain bikers disliking areas which feature long, straight, smooth, level trails. No doubt some mountain bikers may find areas with these features enjoyable for riding, however the riders surveyed at Lake Johnson Park did not. Riders at Lake Johnson Park used trails which were long, straight, level, and smooth (i.e., the paved trails and nearby paved bike path) primarily as a means to access the more desirable unpaved trails.

The second objective of this study was to determine whether activity specialization was related to preferences for various setting attributes. In the correlation analyses of the riders' levels of specialization and preferences, significant relationships were found to exist between 6 of the 18 features and level of specialization. Five of these attributes, "fast downhill sections," "technical sections," "single track trails," "technical descents," and "log crossings/obstacles" were positively related to specialization. All these features typically make a trail more challenging and difficult to ride. This would perhaps explain the appeal of such attributes to specialized riders.

The one significantly and negatively related feature was "level grades". Flat trails typically are not as challenging as rolling and undulating trails. Unlike flat trails, it is much easier to generate speed on trails which are rolling and undulating. This point is especially true if the trail is fairly straight and smooth. Interestingly, both the attributes "smooth trail surfaces" and "long straight sections" were positively related to specialization, perhaps indicating that more specialized riders are more interested in the thrill of speed. This possible desire for speed is consistent with the finding that fast downhill sections were extremely desirable overall, receiving one of the second highest mean scores (7.9).

Two of the features ("muddy sections" and "creek crossing") which were desirable to mountain bikers overall were negatively related to specialization in the correlation analyses. In addition, one feature, "muddy sections," approached significance at the .05 level (p=.054). In other words, as riders' levels of activity specialization increased, they found these attributes less desirable. One possible reason for these negative relationships may have to do with the value of the riders' equipment. As riders become more specialized they tend to ride more expensive and sophisticated bikes. In order to protect their investment and limit unnecessary wear and tear, more specialized riders may prefer to avoid sections with mud and water. Since these specialists ride more often they may not want to spend the time cleaning their equipment after every ride. It may also be possible that more specialized riders are more environmentally conscious and understand the negative environmental impacts associated with mud and water and the possible restrictions that might be placed on riding as a result of these impacts. In certain areas the presence of mountain bikers is most evident by the tracks they leave in the mud and on either side of water crossings. This notion that specialists might be more environmentally aware is consistent with previous studies (Williams and Huffman, 1986; Kauffman

and Graefe, 1984). Similarly, less specialized riders may see the riding of "muddy sections" and "water crossing" as a way of getting dirty and looking more experienced than they really are.

Implications to Management

This study's most important management implication has to do with the information it provides about mountain bikers' preferences for various attributes of riding areas. The knowledge of which trail attributes attract mountain bike riders should help land mangers better understand the needs of this growing group of recreationists. This understanding is essential for effectively managing existing mountain biking areas, planning for new mountain bike trails and managing mountain bike use in areas where such use could have negative impacts. By providing trails which better reflect the preferences of mountain bikers managers can enhance the recreation experiences of this growing group of customers. By providing trails in appropriate areas that are at the same time inherently appealing to mountain bikers, managers can more effectively steer riders away from sensitive resources or conflict prone areas. This more indirect "luring" of riders to appropriate areas can help minimize the need to resort to heavy-handed regulations and enforcement that may foster ill feelings and require expensive on-site management efforts.

The results of this study also suggest that mountain bikers of different levels of specialization prefer different types of areas for their riding. More specialized riders prefer more challenging and technically difficult areas. Managers that provide only one type of trail may not be meeting the needs of large groups of riders and potential riders of their trails. By knowing what riders of different levels of specialization prefer, managers can provide a variety of alternate trails that could better meet the needs of the whole spectrum of mountain biker riders and thereby maximize the recreation satisfaction their areas provide.

It was also significant that the mountain bike use at this park was found to be mainly due to a small core of heavy users. A small core of dedicated users should be easier to inform and work with than a large number of less frequent visitors. If this is true of other off-road riding areas, this has important implications for how managers can communicate with and influence their mountain bike visitors. Finally, this study reminds us that mountain biking is not just a backcountry activity. It is important in small urban/suburban parks and open spaces as well. Due to the proximity of these areas to where people live, managers of these areas must anticipate increased use by mountain bikers and plan accordingly.

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ADVANCING ENVIRONMENTAL STEWARDSHIP IN NEW YORK STATE PARKS AND HISTORIC SITES

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Ninety state park and historic site managers were engaged in a cooperative problem-solving training exercise to identify what they suggest needs to be done to more effectively manage and protect the natural and cultural resources of the New York State Park System. The QtP (Quality-through-Participation) management process was used for this purpose, and proved effective in determining primary needs and action strategies to facilitate implementation of stewardship ideals and principles on a regional and/or park-specific basis.

Background

In 1993, the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) formally released a study on the condition of the park and recreation estate under its administrative jurisdiction. This study -- "Fostering Environmental Stewardship: A First Report on Managing and Protecting the Natural and Cultural Resources of the New York State Park System" (Cobb 1993) -- was initiated as a component of the "New York Statewide Comprehensive Outdoor Recreation Plan" that is updated every five years under administrative and statutory provisions of the Land and Water Conservation Act of 1965 (PL88-578, as amended). It was also undertaken in response to a gubernatorial directive for a stewardship action plan that "... would do more today to assure proper preservation and maintenance of our State Park System" (Cuomo 1990).

The study defined "environmental stewardship" as those policies, programs and resource management functions which serve to inventory, assess, protect or enhance the natural, cultural, scenic and recreational resources of New York's system of state parks and historic sites.

Implicit to this definition is the recognition of outdoor recreation as a beneficiary of clean water, clean air, pleasing landscapes and healthy ecosystems; that the state parks and historic sites themselves are perceived as benchmarks and standards for environmental quality.

This treatise is a sequel to a paper (Cobb 1993) summarizing the key findings and recommendations of the Fostering Environmental Stewardship Report presented at the Northeastern Recreation Research (NERR) Symposium in 1993, and constitutes a needs assessment for advancing environmental stewardship as determined by state park and historic site managers.

Purpose of the Study

The primary purpose of OPRHP's Environmental Stewardship Report was to provide a preliminary evaluation of problems and threats affecting the integrity of the New York State Park System as well as to provide management with a comprehensive set of recommendations and action strategies for advancing stewardship ideals. A further purpose was to establish a framework for additional dialogue and appropriate follow-up action on a regional and park-specific basis. The New York State Park System consists of 11 park regions encompassing 150 state parks and 35 historic sites exclusive of the Adirondack and Catskill Parks. These regional facilities constitute diverse and distinctive natural and cultural features as well as demographic variations among the more than 60 million people who visit them each year.

Methodology

In order to enhance understanding and gain consensus in measures necessary for advancing environmental stewardship of the State Park System, 90 facility managers were enlisted to identify priority needs or issues that they felt were required to be addressed to more effectively manage and protect the natural and cultural resources of their respective parks or sites. The technique involved applying concepts learned in a three-day Quality-through-Participation, or "QtP" Management Training Program conducted at OPRHP's Facility Managers' Institute in the fall of 1993. QtP is based on a management philosophy that envisions a work environment where employees at all levels can make the most of their expertise and creativity, and make decisions that support improved service (Brass 1993). OPRHP is one of 12 prototype agencies in New York State government where the new concepts embodied in total quality management are being applied.

Participants in seven QtP training groups were given the opportunity to review the environmental stewardship report, and were briefed on its scope and purpose. This included a review of findings of OPRHP environmental audits as well as the results of a survey of facility managers conducted by the Nelson A. Rockefeller Institute of Government (NARIG 1993). The NARIG survey identified approximately 4,300 internal and external threats variously affecting the natural, scenic and cultural resources of state parks and historic sites. In general, the threats related to high levels of visitation; physical, chemical and biological intrusions; multiple, and often conflicting demands for use of park resources; incompatible adjacent land uses; the isolation of park ecosystems; and, the debasement of park scenery. Facility managers were also advised of comparable problems being experienced by other park administrations (Caneday 1991; Meyers and Reid 1986; PCAO 1987), including those specific to the states of California (DPR 1983) and Missouri (DNR 1992) as well as the US National Park System (US GAO 1987; US NPS 1981). Similarly, managers were informed of OPRHP's concern about stewardship issues at joint public hearings conducted by New York State Assembly and Senate oversight committees in October 1993 (Caccese 1993).

Findings

Table 1 is a compendium of what OPRHP facility managers suggest needs to be done to more effectively advance environmental stewardship of state parks and historic sites. As noted, the primary concern to managers is the need for adequate personnel and fiscal resources to properly maintain and operate facilities. Indeed, at the legislative hearings on stewardship, it was established that since 1975, the number of OPRHP's permanent employees had decreased by over 30 percent, park attendance had increased by 50 percent, and a myriad of new programs, mandates and facilities had been added to OPRHP administrative responsibilities. These additional responsibilities required the expenditure of over $20 million, or 20 percent of the agency's total operating budget that was not required to be spent in 1972.

Table 1. Facility managers' determination of primary needs for enhancing the management and protection of the natural and cultural resources of New York State Parks and Historic Sites.

Need/Issue Area	Number of QtP Groups Recognizing "Need" as a "Top 3" Major Priority[a]	Number of QtP Groups Recognizing "Need" but not as "Top 3"	Total percent of Groups Identifying "Need"
Availability of sufficient funds, staff and expertise to do the job	7	--	100
Training and professional development	5	1	86
Ability to identify, assess and/or help mitigate problems and threats to park resources resulting from adjacent properties, despoilation of viewsheds, air and water pollution, soil erosion, vandalism, overuse, et al.	4	3	100
Developing and/or updating master plans for state parks and historic sites	3	4	100
Information (inventories, surveys and research) about the natural and cultural resources, and the people who use them	3	2	71
Building formal and informal partnerships with other governmental organizations interest groups and the private sector	2	5	100
Public relations and communication: increasing public awareness, support and/or involvement in the park management function	1	6	100
Placing more emphasis on environmental education and interpretive programs for both internal and external customers	1	5	86

a/ Note: Each of the seven groups was asked to prioritize the three major needs of those identified. (Major priority needs incorporate tied rankings.)

The second priority need identified by facility managers is for training and professional development in the area of natural and cultural resources management. Facility managers have an array of educational backgrounds and experience, but see an on-going need for broadening their expertise and improving skills applicable to a large and diverse number of resource conditions.

Consistent with training and staff development, managers recognize the further need to assume a more pro-active posture in addressing problems and threats to park resources. Of the some 4,300 threats identified in the NARIG survey, about 30 percent were considered major or extreme.

Fourth, facility managers want plans that establish a clear direction for management. Developing and/or updating master plans for state parks and historic sites is a requisite for advancing stewardship and monitoring the condition of these facilities.

Lack of scientific or technical information at the park or site level is a problem that can exacerbate existing conditions. As a fifth important need, managers point out that it is difficult to manage and protect resources that are not well understood. They suggest that natural and cultural resource inventories be conducted in a systematic and timely manner.

A sixth need is for OPRHP to strengthen formal and informal partnerships with other organizations including the National Park Service, the NYS Department of Environmental Conservation, research institutions, and citizen interest groups. Facility managers note that many of the challenges posed by environmental stewardship are too big, and the needs too essential for them to handle on their own.

The two remaining findings of managers were the related needs of increasing public awareness and support of the park management function as well as to enhance public understanding and appreciation of natural and cultural resources through expanded environmental education and interpretive programs.

Discussion

The 1993 Facility Managers' Institute provided a valuable opportunity to ascertain what park and site managers perceive, in a comprehensive manner, what is needed to uphold stewardship ideals and principles embodied in OPRHP mandates, mission and vision statements.

Based on feedback from the seven working groups, and the substantive nature of the needs assessment, QtP proved to be a productive use of this management style on an issue that impacts all OPRHP facilities, and which requires understanding and commitment at all levels of management. Additional feedback from the QtP groups points out, however, that more time is required to address what is properly characterized as a complicated issue. Such continuity is implicit to the action plan for advancing environmental stewardship of New York State parks and historic sites.

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EDUCATIONAL TRAINING AND ATTITUDES TOWARDS RECYCLING AMONG CAMPGROUND MANAGERS IN IOWA

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In surveying managers of Iowa's campgrounds to determine their attitudes and behavior regarding recycling, it was found that attitudes were related to the type of educational backgrounds. For example, managers with park and recreation degrees had less strong conservation orientation than those with educational training in natural sciences which tended to develop the strongest conservationist orientation.

Introduction

The garbage crisis has become a critical issue for nearly every governing body in this country. With the amount of waste increasing every year and solid waste disposal sites filling up and closing rapidly, the need to encourage recycling becomes more critical each day. Yet developing and implementing waste disposal plans is increasingly difficult especially for park and recreation agencies with limited resources and vague directives.

Iowa's parks and camping areas provide an excellent setting for the exploration and evaluation of attitudes and behaviors regarding recycling and comprehensive waste management programs. In the fall of 1991, Iowa State University completed a comprehensive study of Iowa campground managers to document current solid waste management practices and recycling efforts and to identify recreation site managers' attitudes, perceptions, knowledge and motives regarding recycling and solid waste disposal technologies.

When one tries to look at the reasons why one manager is more accepting of recycling in their campground and more motivated to develop and implement new solid waste disposal programs and policies, many questions arise. There are many factors which affect people's attitudes and behaviors. One factor that has been examined in other studies is educational training (Pletcher, Walther & McConocha 1989). In this paper we examine that link between educational background and attitudes towards recycling.

Thus, the objectives of this paper are twofold:

1. To identify and classify park mangers' perceptions of the benefits and barriers to the development of comprehensive park based recycling programs;
2. To examine the relationship between educational training and park managers recycling perceptions.

Methods

The survey of all public and of Iowa's campgrounds was conducted in the Fall 1991 by Iowa State University (Robertson 1992). A 10-page booklet was sent to the managers of all 488 of Iowa's public and private campgrounds. Subtracting questionnaires found to be duplicative , a total of 378 usable questionnaires were completed for a final response rate of 86%. Because of non response on the educational background question, only 292 respondents are included in our analysis of variance. The response rate varied by administrative unit of camping area, 88 % of managers of state parks responded, 100% of the federal campground managers, 74% of the county and local managers and only 30% of the private campground managers. The final number of managers included in the study is shown in Table 1.

Table 1. Number of response by type of campground.

# of managers	type of campground
59	State
19	Federal
263	County
12	Local
2	Not for profit
23	Private

This paper looks at the relationship between two variables, educational background and the attitudes of campground managers towards recycling. The variable of educational background was defined by grouping the different educational programs which managers listed as their "educational training" into three main categories which we called Natural Sciences, Resource Management and Park and Recreation/Social Sciences. Table 2 shows how the variable was defined.

Table 2. Definition of educational training.

		Number	Percent
NS	Natural Sciences	161	54.9%
	(Biology, Ecology, etc.)		
RS	Resource Management		
	Forestry	25	8.5%
	Natural Resource Management	15	5.1%
	(Fish & Wildlife, Range Mgmt.)		
PR	Park and Recreation /Social Sciences		
	Park & Recreation Management	66	22.5%
	Social Science	3	1.0%
	Law Enforcement	5	1.7%
	Education	6	2.0%
	Business Administration	6	2.0%
	Associate of Arts	6	2.0%

The variable of attitude towards recycling was developed by performing a factor analysis on the 39 reasons listed in the questionnaire for recycling or not recycling. Respondents were asked to rate on a 5 point scale from "not important" to "extremely important" 22 reasons for recycling and 17 reasons for not recycling. The factor analysis yielded 10 interpretable and conceptually meaningful factors with eigenvalues above 1.0 which we tested for internal reliability. These 10 factors explained 65% of the total variance. Table 3 lists the factor names, the item content, the reliability test's alpha level , the eigenvalues and the proportion of variance explained by each of the 10 factors. Finally, to examine the relationship between the attitude variable and educational background, we used a one-way analysis of variance of the 10 scales created from the factors and the 3 types of educational background.

Table 3. Results of factor analysis.

(alpha)	Factor Loading	Explained Variance
Factor 1 (.882)		18%
Resource Conservation		
To conserve energy	.798	
To conserve natural resources	.773	
It saves resources for future generations	.771	
Due to shortages in raw materials	.762	
Recycling is an effective way to protect and preserve resources	.693	
To save landfill space	.689	
Factor 2 (.718)		14%
Social values		
To be recognized as an environmentalist	.78	
Because I recycle at home	.678	
Because it makes a person feel good	.671	
Because it is the right thing to do	.559	
Factor 3 (.653)		7%
Inconvenience		
Don't want to be bothered	.695	
Abundance of raw materials	.687	
Lack of financial incentives	.629	
Factor 4 (.766)		5%
Administrative barriers		
Not enough staff to manage a recycling program	.814	
Lack of appropriate facilities for recycling	.687	
No pickup service in the area	.616	
Too costly to administer	.569	
Factor 5 (.829)		4%
Educational values		
To introduce park visitors to recycling	.714	
To educate park visitors on the values of recycling	.632	
To set a good example for park visitors	.549	
Factor 6 (.684)		4%
Social pressures		
Legal requirements	.72	
Because other park and recreations areas recycle	.66	
To help charitable organizations	.647	
To create local jobs	.491	
Factor 7 (.630)		4%
No support		
Agency doesn't encourage development of recycling programs	.684	
Campers would not participate in programs	.687	
Lack of volunteer or interest group support	.51	
Too costly to administer	.569	
Factor 8 (.717)		3%
Structural barriers		
No market for the recycled materials	.78	
Not enough garbage to justify development of recycling program.	.46	
Too costly to administer	.403	
Lack of volunteer or interest group support	.326	
Factor 9 (.593)		3%
Not required		
Should be left to volunteer and not-for-profit groups	.75	
Should be left to private sector	.67	
Don't know how to recycle	.404	
Factor 10 (.424)		3%
Economic reasons		
To reduce the cost of garbage collection	.789	
To get money for recyclable materials	.590	

Results

The results of the analysis of variance are shown in Table 5, but can be summarized in the following 10 statements:

1. Park and Recreation Management graduates consider conservation a less important reason for recycling than graduates of Natural Sciences.
2. Resource Management graduates consider social values significantly more important reason for recycling than either of the other two groups.
3. Park and Recreation Management graduates rate inconvenience as a more important reason for NOT recycling than graduates of either Natural Sciences or Resource Management.
4. Administrative barriers were rated as significant reason for NOT recycling by all campground managers regardless of educational background.
5. Resource Management graduates felt the educational value of recycling programs were significantly more important than the Natural Science majors.
6. Resource Management and Park and Recreation graduates felt significantly more social pressure to recycle than the Natural Science majors.
7. No significant differences were found between the groups ratings of the lack of support variable.
8. Park and Recreation Management graduates consider structural barriers to be significantly more important reasons for NOT recycling than graduates with Natural Sciences backgrounds.
9. Resource Management graduates rated leaving recycling programs to other groups as a significantly less important reason for NOT recycling than the managers of the other two educational backgrounds.
10. Resource Management graduates consider economic reasons significantly more important reason for recycling than either of the other two groups.

Table 4. Results of analysis of variance.

Factor number and name F ratio and probability	Means for each type of educational background (codes used to indicate significant difference)		
	NS (a)	RS (b)	PR (c)
1. Conservation F =4.21 .016	3.57	3.53	3.37a
2. Social values F=6.67 .001	2.89	3.19ac	2.66
3. Inconvenience F=5.67 .006	1.78	1.98	2.13a
4. Administrative barriers F=1.90 .152	3.33	3.43	3.12
5. Educational values F=3.69 .026	3.56	3.94a	3.62
6. Social pressures F=7.45 .0007	2.32	2.60a	2.60a
7. No support F=1.88 .155	2.16	2.32	2.07
8. Structural barriers F=4.47 .012	2.78	3.09	3.11a
9. No requirements F=8.71 .0002	1.70	1.29ac	1.81
10. Economic reasons F=5.69 .004	2.69	3.14ac	2.63

a, b, c indicate which variables are significantly different from each other

Conclusions and Implications

To summarize the conclusions, the Natural Science majors were the most conservation oriented, tending to see the need to recycle in more scientific or biological terms. They were the least likely to see the educational benefits of recycling programs, and weren't swayed by social pressures.

The Resource Management majors were the most interested in being recognized as an environmentalist and recycled because it was the "right thing to do". They more strongly favored using recycling program for educational purposes and though they wanted to educate the public, they were least likely to think the job of recycling should be the responsibility of anyone else but themselves. They were the group that saw the most value in recycling for economic reasons.

Park and Recreation/Social Science majors were the least conservation oriented, tended to be most likely to see the barriers to recycling. They more than any other group felt that recycling was an inconvenience. Not surprisingly they were most likely to think that someone other than themselves should handle the job of recycling and were the group most often to say that they didn't know how to recycle. Managers with this type of educational background were the least interested in being recognized as environmentalists. They were most swayed be social pressures of others recycling and were more likely than other groups to cited reasons to recycle in terms of helping charitable groups or created local jobs.

The implications of the findings of this study could be seen from a number of different orientations. Certainly there are implications for those in the educational training field. College programs should be aware of both the strong points and the deficiencies of their respective programs. Natural Science majors could use more emphasis on social aspects, for example, to see the educational benefits in recycling programs. Park and Recreation educational training could certainly benefit from more emphasis on the biological aspects as they apply to programs such

as recycling. Helping Park and Recreation majors develop a stronger conservation ethic would broaden their view of management jobs.

Another orientation might be that of marketing. One could use these findings to better market recycling programs to each of these different groups. Tailoring the message of the need to recycle to each groups' orientation will more than likely help "sell" the concept.

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VALIDITY OF USING PHOTOGRAPHS TO SIMULATE VISIBLE QUALITIES OF FOREST RECREATION ENVIRONMENTS [1]

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Forest recreation managers and researchers interested in conserving and improving the visual quality and recreation opportunities available in forest environments must often resort to simulations as a means of illustrating alternatives for potential users to evaluate. This paper reviews the results of prior research evaluating the validity of using photographic simulations to represent forest environments (i.e. comparing responses obtained in the field to those of photographic representations). The findings of three previously unreported validity tests conducted in northeastern forests are presented. The results indicate that simulations are both effective and appropriate useful to represent in stand conditions. However, simulations that involve a portion of a wider vista may have difficulty establishing the wider context of the scenes.

Introduction

Photographic representations have been used in studies of landscape perceptions and preferences because they offer greater economy, speed, and control than site visits. The use of photographs avoids the costly and time-consuming task of transporting respondents to the scenes, and photographs can be altered to allow for controlled comparisons among alternative conditions.

Studies have repeatedly shown that evaluations done from photographic representations are highly correlated with on-site evaluations of the same areas. However, this body of research is not without its weaknesses, such that a researcher can not always generalize from one study to the next or find guidance for their own research approach. As Zube et al. (1982) point out, there is no theoretical framework that brings coherence to the wide variety in the type of scenes studied, the regions where these studies take place, and the research methods employed. The scope of scenes used in these studies range from forested through open countryside to suburban and urban landscapes The scale of these scenes ranges from small-scale foreground views to large-scale vistas.

While research in the area of visual qualities of forests exist -- over 100 empirical reports -- most studies have been done in the coniferous forests of the Southwest (Hoffman et al. 1993). A few studies have focused on the northern hardwoods (Brush 1979; Palmer 1990, 1993; Ribe 1990) and only one study looked specifically at slides as a valid and reliable media for representing in-stand forest conditions (Shafer & Richards 1974).

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This paper reviews the literature investigating the validity of photographic media to represent environmental conditions, and summarizes the findings for three new studies that investigate the validity and reliability of photographic media for representing the visible conditions of hardwood forests in the Northeast. The three studies considered middle ground views of clearcutting alternative in the White Mountain National Forest, New Hampshire, the visual effects of slash after an uneven age management harvest cut at Cuyler Hill State Forest, New York, and the impacts of deer pressure on forest regeneration at Fools' Creek in the Allegany National Forest, Pennsylvania.

Literature Review

A total of 16 studies have been identified that explicitly tested the validity of photographic media to represent the visual quality of the environment. Of these only three took place in northeast. Table 1 summarizes the characteristics of these studies.

Studies Done in the Northeast

The results of Brush's (1979) study of scenic preferences of forested areas in Massachusetts found a correlation of $r = 0.67$ ($p = 0.001$) between those scenic evaluations done from color photographs and those done in the field. The evaluations were completed by two groups of non-forestry students. Both groups used the same five-point scale for their evaluations ranging from very attractive (1) to very unattractive (5). One group of 48 evaluated 10 color photographs; the other group of 48 rated the forest sites in the field from the same view point and in the same direction that the photographs had been taken. Brush notes that some of the variance may be explained by the changes that occurred at the sites during the year that lapsed between the field and photographic evaluations.

The watersheds of the upper East Branch of Brandywine in Chester County and the North Branch of Neshaminy Creek in Bucks County, Pennsylvania were the study sites for Coughlin and Goldstein (1970). Two respondents evaluated 92 in-field points along a road; three to four color slides taken from these same points were used for slide evaluations completed by 11 respondents. All the respondents were affiliates or employees of the Regional Science Research Institute. A seven-point interval scale ranging from 1 = most negative response to 7 = most positive response was used. The authors reported that the mean ratings of the field respondents were significantly correlated ($r = 0.64$, $p < 0.001$) with the mean scenic beauty rating given by the respondents which evaluated slides of each location.

Rabinowitz and Coughlin (1971) used 14 sites on the banks of small streams in the vicinity of Philadelphia. The character of the sites ranged from densely to somewhat less densely developed suburban areas, including open farm country about 20-miles outside the city. The majority of the sites were wooded. Ten suburban housewives completed the in-field evaluations; eight respondents, also suburban housewives, completed the slide evaluations from 39 slides - one to three slides for each of the 14 stream sites. The field group used a two-page questionnaire which included a request for a brief objective description of each site, 14 five-point rating scales (1 = dislike very much, 5 = like very much), and 15 five-point semantic differential scales. The slide group used a one to five point scale for three preference questions regarding the respondents preferences to "live here," "a place to pass through and enjoy the scenery," and "to use this site for recreation". Also, six weeks after the in-field evaluations had been completed the same 10 respondents were asked to complete evaluations from slides of the sites they had visited. The correlations between the in-field and slide evaluations which were completed by the one group were greater than $r = 0.89$ ($p < 0.001$). Results comparing the evaluations of the field and slide-only groups were not reported.

Eight sites representing urban to forested landscapes were used by Shafer and Richards (1974) in their study comparing viewer reactions to outdoor scenes and photographs of those scenes. Three groups of respondents, randomly selected undergraduate photography students at Syracuse University in Syracuse, New

York, evaluated the eight scenes from either in-field, slides, or color photographs. They used 27 bi-polar, seven-step semantic differential scales for the evaluations. These authors concluded that when color slides or photographs adequately depict most of the variation of natural and man-made environments, the adjective-pair measurement of responses to the picture presentations agree with similar in-field responses to the same scenes.

Zube et al. (1975) used an 18-point semantic differential scale, a landscape-feature checklist, scenic quality categories, and preference for use rank order in the evaluation of scenes in the southern half of the Connecticut River Valley. Thirteen sub-groups evaluated scenes which included working farms, village centers, suburban neighborhoods, strip developments, and forests. Five of the groups completed the in-field evaluations; the other eight groups completed the evaluations from panoramic and regular format color photographs. Responses of each sub-group were correlated with those of every other sub-group. Results reported show 82 percent of the correlations at r = 0.80 level or higher.

Studies Done Outside the Northeast

Twenty campsites located at five areas within Mt. Jefferson Wilderness Area in Oregon served as study sites for Shelby and Harris's (1985) study of campers' scenic beauty acceptability and camping desirability preferences. The 427 respondents completed evaluations for three to five campsites in the field and from color photographs during their visit using a five point scale with 1 = totally acceptable and 5 = totally unacceptable. They also ranked the sites in order of preference. The authors reported that of the 20 campsites evaluated in-field and from photographs the average scenic beauty acceptability evaluations were significantly different at two sites ($p < 0.05$), and the average camping desirability evaluations were significantly different at five sites. On the sites where disagreement occurred, the evaluations done from photographs were higher than the in-field evaluations. However, for the overall preference rankings, where photograph and in-field rankings agreed for 15 of the 20 sites, the rankings based on photographs were lower than those based on in-field scenes where disagreement occurred.

The respondents in Shuttleworth's (1980) study of scenic beauty evaluations done in the field and from photographs viewed 12 scenes of the University of East Anglia, England. Ninety-three environmental studies students were divided into two groups each of which completed in-field evaluations of six of the 12 scenes. The two groups were then further subdivided -- half of each group evaluated the scenes from black-and-white photographs, the other half from color photographs. They used seven semantic differential landscape scales and rank ordered the scenes for scenic beauty. The results indicate that there were very few significant differences between the evaluations. Black-and-white photographs tended to induce more extreme and more differentiated responses than the color photographs. Evaluations from color photographs agreed more closely to those done in-field than the black-and-white photographs.

Boster and Daniel (1972) used six Ponderosa pine sites in Arizona for their study sites. Five of the sites had received treatments -- uniform stripcut, clearcut, heavy thinning, and conventional logging. The remaining site was a natural, untreated area. The respondents for this study included: 27 Northern Arizona University students who completed scenic beauty evaluations of the six sites in the field, and 30 University of Arizona students and 10 members of the Arizona Water Resource Committee who completed the scenic beauty evaluations from slides of each of the six sites. All the evaluations were done using a 10-point scale with 0 being "I am absolutely certain that I dislike the area represented by the slide/scene" and 9 being "I am absolutely certain that I like the area represented by the slide/scene." Their results show that the mean ratings of the field and slide groups to be statistically indistinguishable with a correlation of r = 0.99.

Eleven forested campgrounds in north-central Arizona served as sites for Brown et al.'s (1988) study of campers' scenic beauty preferences. Seven hundred and twenty-seven campers evaluated the scenic beauty of the campsites both in the field and from color photographs. A 10 point scale was used for the evaluations ranging from 1 = very low scenic beauty to 10 = very high scenic beauty. Individual t-tests showed that the ratings done in the field were all significantly higher than the photo-based ratings of the same sites. The correlation between mean ratings done in the field and those completed from the photographs was $r = 0.76$, suggesting that photo-based ratings do provide a reasonably good indication of relative on-site scenic beauty.

Clamp (1975) had 75 volunteer respondents complete scenic beauty evaluations of 170 sites representing a variety of landscapes characteristic of England. (Major urban centers and military property were avoided.) All the respondents completed evaluations in the field and from color slides. A 12-point scale was used for the evaluations ranging from 1 for "very, very attractive" to 12 for "very, very unattractive." The comparison of in-field and slide evaluations resulted in a correlation of r = 0.80.

A broad array of landscape types -- residential areas, shopping centers, commercial highway strip, light industrial park, office complex, and grazing land -- were used in scenic beauty evaluations for Craik's (1975) study in Marin County, California. A random county-wide sample of 522 respondents completed descriptive evaluations of the scenes from an auto tour through a site, a color film of a simulated eye-level tour through a scale model of a site, or a black-and-white video of the scale model tour. The evaluations were in the form of a checklist of 240 adjectives frequently used to describe landscape scenes. Respondents were told to read through the list and put an "X" beside each adjective they considered descriptive of the designated landscape. Craik reported correlations of r = 0.80 and better for comparisons of adjectives checked to describe each of the presentation formats.

Hull and Stewart (1992) had respondents evaluate 12 scenes in the White River National Forest in Colorado for scenic beauty and recreation satisfaction. Respondents included two groups each of 45 day-hikers and one group of 32 students. The day-hikers completed in-field evaluations during their visit; their photo evaluations of the same scenes were completed both three and nine months later from a booklet of color photographs sent to them by the researchers. The students completed the evaluations from slides of the same scenes twice over a three month period. Correlations between the in-field and photo evaluations of the day-hikers was r = 0.80 ($p = 0.05$). Correlations between the in-field groups and the students were reported as r = 0.85 ($p < 0.01$). The authors suggest that the differences between in-field and photo-based evaluations seem to be caused, in part, by differences in meaning, novelty, and mood between the in-field and photographic contexts.

Lane et al. (1975) had 66 students complete scenic beauty evaluations in the field and from three simultaneously projected color slides of five sites located in the upper Piedmont area of South Carolina. The five areas included a picnic area on a lake, a hardwood stand on a relatively steep slope, a small lake with a forested shoreline, a picnic area on a small stream in a hardwood stand, and a loblolly pine plantation. The respondents used a nine-point scale ranging from 1 = like extremely to 9 = dislike extremely. Results reported that with the exception of the small lake area, the sites were given a higher scenic beauty preference from the slide evaluations than from the in-field evaluations. The authors suggest that this may be because the slides tend to "glamorize" some sites. For example, roads and parking areas were not evident in the slides, but they were apparent in the field.

Kellomaki and Savolainen (1984) had respondents complete scenic evaluations of 34 forest stands at forestry field stations located near the University of Helsinki. Five groups of respondents completed the evaluations using a seven-point, single adjective scale. The first two groups, comprised of first year

forestry students, evaluated scenes both in the field and from black-and-white photographs. The other three groups -- another group of forestry students and two groups of randomly selected city dwellers -- completed evaluations from only the black-and-white photograph. The correlation between field and photographic ratings done by the two first two groups was r = 0.94 ($p < 0.01$). A correlation of r = 0.83 ($p < 0.01$) was reported when the ratings from the photographs only were compared across all five groups. Kellomaki and Savolainen concluded that black-and-white photographs may be a reliable tool for estimating the scenic value of forest landscapes.

Table 1. Studies that sought to validate the efficacy of photographic media with field evaluations.

	Correlation	Region	Forested	Open countryside	Urban/suburban	Scenic beauty	Other connotative attributes	Denotative attributes	Specified a use in context	Black and white	Color	Prints	Slides	Film or video	Panoramic montage	Different field/photo subjects	Same field/photo subjects	Controled for field/photo order	Sampling method
Boster & Daniel, 1972	.99	SW	●			●					●		●			●			S/C
Brown et al., 1988	.76	SW	●			●					●	●					●		U
Brush, 1979	.67	NE	●			●					●	●				●			S/U
Clamp, 1975	.80	E	●	●	●	●					●	●		●			●		R
Coughlin & Goldstein, 1970	.64	NE	●	●	●	●					●		●			●			S
Craik, 1975	>.80	SW		●	●		●	●		●	●			●		●			R
Hull & Stewart, 1992	.80	SE	●	●		●	●				●	●	●			●	●		S/U
Kellomaki & Savolainen, 1984	.83	E	●			●				●		●				●	●		S/R
Lane et al., 1975	n/a	SE	●						●		●		●		●		●		S
Rabinowitz & Coughlin, 1971	.89	NE	●	●	●	●	●	●	●		●		●			●	●		R
Shafer & Richards, 1974	n/a	NE	●	●	●	●	●	●			●	●	●			●			S
Shelby & Harris, 1985	n/a	NW	●			●	●				●	●				●			U
Shuttleworth, 1980	.89	E	●	●	●	●	●	●		●	●	●					●	●	S
Sorte, 1975	n/a	E			●	●	●	●			●	●	●	●		●			U
Stewart et al., 1984	.67	SW		●	●	●	●				●		●				●		R
Zube, Pitt & Anderson, 1975	.80	NE		●	●	●	●		●		●	●				●			S/R

Notes : Sampling method for respondents: available students (S), civic groups (C), random (R), or users (U).
Region of study: northeast (NE), northwest (NW), southeast (SE), southwest (SW), or Europe (E).

Sorte (1975) looked at evaluations done in-field and from various media types for two urban/suburban row house-type living units in Sweden. The respondents completed evaluations from plan and perspective illustrations, models, color slides and a movie taken of the models, and color slides and a movie of the actual sites. The seven-point semantic scale used for the evaluations were based on pleasantness, enclosedness, complexity, social status, and unity. A review of the means reported shows that the mean evaluation for the model-based slides and movie, and the field-based slides and movie were lower than the mean ratings from the in-field evaluations done at both sites.

Stewart et al. (1984) had seven respondents make 100 ± site visits at various times of the day to evaluate visual air quality. After completing the in-field evaluations, the respondents photographed each of the specified views around Denver, Colorado. Seven point scales were used to evaluate the visual air quality based on clarity, border, and source. In evaluations done from the photographs they had taken, the means of those evaluations across respondents were compared with the corresponding means of evaluations done in the field. For all but two respondents, the mean from photographs was significantly lower ($p < 0.01$) than the mean from the in-field evaluations. The authors suggest that

this may indicate a tendency for visual air quality to look worse in photographs than in the field. Median correlations for each respondent between evaluations of photographs and in-field ranged from r = 0.51 to r = 0.83.

Study Methods

The materials and data for this paper are drawn from three northeastern hardwood forest sites being studied to better understand major forest management issues.

White Mountain National Forest in New Hampshire

The visual affect of harvesting alternatives were simulated in this study from two vista sites: Sugar Loaf and Welsh Ledge. In all there were 30 simulations representing different sized clearcuts, patterns and intensities. These simulations represented variation in the size of the clearcut openings (approximately 4.5, 12 or 25 acres), the intensity of the cutting (1, 2, 3, 4, or 5 percent of the viewshed), and the placement pattern (scattered or concentrated) of the cutting sites. Also included among these simulations were the photograph of the original view take the previous year and a completely revegetated simulation. Twenty-six different hikers at each site (n = 52), used a 10-point bi-polar scale to rate the scenic value of all 32 scenes. The interviews were conducted in the field at the view point. The hikers also rated the actual view and were asked to locate the scene that most resembled the view from among the 32 photographs.

Cuyler Hill State Forest in Central New York

This is a demonstration site for uneven age single-tree selection silviculture. The area was marked according to research guidelines and harvested by a commercial logger in late-August 1993. The last previous harvest was in mid-1970. Two existing data collection points with similar appearance were selected in the treatment area and a third point from a neighboring research stand with similar forest structure was selected as a control site. All three sites were photographed in mid-July. The two treatment sites were rephotographed a week after the harvest. The slash was lopped to the ground at one of these sites and rephotographed. This resulted in the sites representing three different field conditions: uncut, slash, and lopped. Two non-overlapping views were photographed using color 35mm film at all three sites in their uncut condition, at two sites in their slash condition, and one with the slash lopped. All three sites were visited by 12 landscape architecture students during September and the harvested sites by 20 forestry students in October.[2] Twenty-four bi-polar scales were used to describe various visible forest characteristics, including overall scenic beauty. All participants rated the field sites and twelve photographic slides.

Allegheny National Forest in Western Pennsylvania

Regeneration failure after harvesting in western Pennsylvania forests has become a serious problem due to excessive browsing by the deer population. Fenced plots at Fool's Creek have been established to study the effects of deer density on forest vegetation. There were two controlled densities of 10 and 64 deer per square mile. Within each density, there is an area that has been uncut, thinned to 60 percent stocking, and clearcut in 1968. A third unfenced site was clearcut and remained open to the natural density of greater than 100 deer per square mile. During the second week of September, 1994, a color 35mm slide was taken at each site to represent each management condition, for a total of 7 slides. On 16 October 1994, a group of 27 students and their professors on a biology field trip evaluated all the slides and sites. They used 24 bi-polar scales to describe the forest's visible characteristics, including an overall rating of scenic beauty.

Findings

The data provided for 14 comparisons between ratings in the field and of photographic representations: 2 in White Mountain National Forest, 6 in Cuyler Hill State Forest, and 7 in Allegany National Forest. The mean ratings for these sites are shown in table 2, along with paired t -test and Pearson correlation coefficients. In 10 cases, the rating in the field was more scenic than of the photograph or slide, in 3 cases it was less scenic, and in 1 they had the same value. A two-tailed sign test indicates a probability of .092 for this or a more extreme distribution. While there is an obvious pattern of higher ratings being made in the field, it does not meet the normal threshold of statistical significance. In only three cases did the t –test indicate that the field and photographic ratings are significantly different at the .05 level. The average correlation between the field and photographic ratings is .388, substantially below those in the literature review.

White Mountain National Forest

This study was originated by the Forest Service because they were unaware of the public's awareness and attitude towards clearcutting on the National Forest. The presence of harvesting activity in the field view was recognized by 96 percent of the respondents at Sugar Loaf and 81 percent at Welsh Ledge. Hikers correctly picked the actual view out of 32 photographs 36 percent of the time at Sugar Loaf and 26 percent of the time at Welsh Ledge. While these levels of recognition are not exceptionally high, it must be remembered that all 32 photographs were quite similar and from exactly the same view point. The binomial test sets the probability of this many hikers at either site identifying one item out of 32 is very, very small ($p < .0001$). This result indicates we can have some confidence that observers are able to use subtle distinctions present in a photograph to distinguish a scene.

The ratings of the actual view are much higher than for the photograph. In addition, the Pearson correlation between the field and photo scenic rating is .258 at Sugar Loaf and .241 at Welsh Ledge. These two results indicate a poor correspondence between scenic evaluations made in the field and from the photographs. Probable causes for this are that the previous year when the photos were taken was drier and vegetation was therefore browner. Perhaps more important is that the contextual affect of a breathtaking vista in the field cannot be fully represented by in single photograph. Respondents had trouble limiting their scope of view and wanted to focus on landmarks (e.g. Mount Washington from Sugar Loaf) outside the photograph. This was true even though they were directed where to focus their attention when rating the view in the field.

2/ The uncut control site could not be visited because access was blocked by a vehicle left in the middle of the road by a thoughtless NYS DEC employee.

Table 2. Means, *t*-tests and correlations for scenic ratings in the field and matching photographs or slides for views at several sites.

Evaluation sites	Mean Field	Mean Photo	*t* – test *t*-value	*t* – test p (2-tail)	Peason Correlation	n
White Mountain NF: view point [a]						
Sugar Loaf	6.23	3.54	4.53	.0001	.258	27
Welsh Ledge	7.08	5.71	2.70	.013	.241	24
Cuyler Hill SF: treatment, raters [b]						
Uncut, LA	3.25	3.17	0.24	.815	.245	12
Cut with slash, LA	3.83	4.88	-1.71	.116	.051	12
Cut with lopped slash, LA	3.67	3.21	2.26	.067	.807	12
Uncut, For	--	3.16	--	--	--	20
Cut with slash, For	3.35	3.97	-1.67	.110	.288	20
Cut with lopped slash, For	3.65	3.16	1.59	.127	.449	20
Allegany NF: density, treatment [b]						
10 d/sm uncut	2.13	1.96	1.16	.257	.781	23
10 d/sm, thinned	2.72	2.56	0.46	.651	.097	25
10 d/sm, clearcut	3.96	3.58	0.89	.380	.196	26
64 d/sm, uncut	**2.65**	**2.00**	**3.16**	**.004**	**.501**	**26**
64 d/sm, thinned	2.66	2.11	1.97	.066	.355	18
64 d/sm, clearcut	4.59	4.59	0.00	1.00	.375	22
Uncontrolled, failed clearcut	2.95	3.05	-0.37	.715	.791	21

[a] Rating scale of 1 = low scenic value to 10 = high scenic value.
[b] Rating scale of 1 = beautiful to 7 = ugly.

Cuyler Hill State Forest

The results of an analysis of variance shown in Table 3 indicate that there is no significant difference between evaluations made in the field and of slides of the same condition at the same site. Nor did it matter whether the evaluations were made by students trained in forestry (i.e. more oriented toward the benefits of timber productivity) or landscape architecture (i.e. more oriented toward minimal environmental impacts and aesthetic benefits). However the effect of treatment was significant. Tukey's LSD post hoc test indicates that the cut with slash condition was judged significantly more ugly than the uncut (p = .002) or lopped (p = .008) conditions. The difference between the uncut and lopped conditions was not significant (p = .251). The only interaction term to be significant was between treatment and field/slide. This is probably due to the influence of the landscape architecture students' ratings of the untreated slash condition, which almost reached significance in Table 2.

Two slides were used to represent the three field conditions. A Tukey's LSD indicates there is no significant difference between the slides at the uncut (p = .537) and lopped (p = .691) sites, it is significant at the cut site with slash (p = .006).

Over all, this provides a strong indication that slash has a negative visual affect that can be mitigated by lopping. These results also support the efficacy of slides to evaluate the visual impacts of slash in hardwood forests.

Table 3. Analysis of variance for the effects of field or slide evaluation, slash treatment, respondent background, and their second order interactions on scenic beautiful at Cuyler Hill State Forest.

Source	df	Sums of Squares	Mean Square	F-ratio	Probability
Constant	1	3218.3	3218.2	1606.4	≤ 0.0001
field/slide	1	0.1	0.1	0.1	0.8078
treatment	2	24.6	12.3	6.2	0.0025
For/LA	1	4.6	4.6	2.3	0.1329
treatment*f/s	2	17.5	8.8	4.4	0.0136
For/LA*f/s	1	0.5	0.5	0.2	0.6180
For/LA*trt	2	5.9	2.9	1.5	0.2321
Error	253	506.8	2.0		
Total	262	593.7			

Allegheny National Forest

The results of an analysis of variance in table 4 indicates again that there is no overall difference between the field and slide ratings of scenic beauty. However, the *t*–tests reported in Table 2 indicate that there is a significant difference between the field and photo ratings for the uncut condition at 64 deer per square mile. This difference may be due to season change (Palmer 1990; Palmer & Sena 1993; Buhyoff & Wellman 1979). Slides were taken in mid-September and the field ratings were made mid-October. In the intervening month, the effects of fall had crept onto these sites changing the appearance somewhat. In the words of the proctor: "there was lots of green fern in the pictures and a lot of brown fern in the woods." The average Pearson correlation between the seven field and slide ratings is .516.

The ANOVA also indicates that both silvicultural treatment and deer density do have a significant impact on scenic value. The Tukey's LSD post hoc test indicates that clearcut areas are significantly more ugly than the uncut and thinned conditions. However, uncut and thinned are not significantly different. The results relating to deer density are not as meaningful, since the controlled conditions are not significantly different and the uncontrolled condition had only a clearcut treatment. However, Tukey's LSD for the clearcut condition indicates that the scenic effects of all three deer densities are significantly different

Table 4. Analysis of variance for the effects of field or slide evaluation, treatment, deer density, and their second order interactions on scenic beautiful at the Fool's Creek Deer Management Area.

Source	df	Sums of Squares	Mean Square	F-ratio	Prob
Const	1	3102.0	3102.0	1521.4	≤ 0.0001
field/slide	1	2.6	2.6	1.3	0.261
deer/square mile	2	48.5	24.2	11.9	≤ 0.0001
treatment	2	159.6	79.8	39.1	≤ 0.0001
d/sm*f/s	2.0	1.4	0.7	0.337	0.7144
treatment*f/s	2	0.1	0.1	0.0	0.965
d/sm*treatment	2	11.6	5.8	2.8	0.060
Error	334	681.0	2.0		
Total	345	946.0			

Conclusions

The literature reporting results or methods dependent upon photographic representation of forested environments covers a broad range of subject areas. For example, the interaction between visual quality and recreational experiences, the scenic impact of forest management practices, and the effectiveness of various research methodologies in assessing visual quality. Establishing the reliability and validity of photographic media is clearly necessary for the responsible use of this method. In 1974 Shafer and Richards concluded that:

> when color-slide or picture presentations adequately depict most of the natural and man-made environments, the adjective-pair measurement of response to the picture presentations agrees favorably with similarly measured on-site responses to the same scenes.

At the same time, experimental results also suggest that if pictorial presentations include only a portion of the total variation in natural environments, responses to such presentations are significantly different fro on-site response patterns to the same conditions.

This advice is reinforced by the literature reviewed and results reported in this paper.

Studies looking at testing the validity and reliability of photographic media cite three main concerns regarding the perceptual distortions that occur when a photo or slide is used as a surrogate display. These limitations include context representation, and attribute perception.

Context Representation

There are obvious differences in context between a photo or slide of a view and the view as seen on-site. The eye can take in a larger field of view than a photo and is able to focus greater attention to objects of interest. The human eye has a 120-degree lateral cone of vision as compared to the 35mm camera lens used in most visual quality research which has a much more limited 65-degree lateral cone of vision.

In the context visible from the vista viewpoints used for the White Mountain study reported here was breathtaking and much more extensive that the focused views in the simulations. They tended to incorporate this context in their judgment, even when directed to evaluate only the area represented in the photograph. This is clear from their responses to an open-ended question to describe what they saw. While the evaluations of the slides may be accurate in and of themselves, it cannot be claimed that they represent the conditions within this larger context.

Attribute Perception

Understanding a site's visual attributes, such as color, lighting, scale, shape, and distances, may not be sufficiently accurate when based on perceptions of a photograph (Shelby & Harris, 1985; Shuttleworth, 1980). Of course there are additional perceptions that cannot be represented by a visual medium: sounds, smells, tastes, touch, and kinesthetic experience.

A photo or slide is a two-dimensional static image with a very limited depth of field. It is sometimes difficult to photograph the forest because the trees get in the way. It is important view points are not selected for photographic convenience. For instance, care should be taken not to stand in an area that is more open than normal. Care should be taken to obtain maximum depth of field, which may require that a tripod and slower shutter speeds are used. It is also best to take photographs on overcast days with the sun high overhead to reduce the effect of highly contrasting lighting. The image's composition is also a concern. The image should be horizontally accurate and not artistically framed or artificially focused on feature elements. It should become common practice that more than one image be used to represent a site's visual condition. This need is illustrated by the significant difference in ratings for the two slides representing residual slash at Cuyler Hill.

A photograph records the condition of a particular point in time. Palmer (1990) has shown that seasonal change affects scenic evaluation, but that respondents rate the same view differently when it is presented in divergent seasons for evaluation. Researchers must therefore remain cognizant of the importance of changing conditions such as foliage density or color.

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Outdoor Recreation: Satisfaction & Conflict



FACTORS IMPACTING THE SATISFACTION OF PRIVATE CAMPSITE OWNERS WITH CAMPGROUND RECREATION OPERATIONS

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This project investigated the satisfaction of private campsite owners with their campground recreation operations. Regression analysis found five items impacted the overall satisfaction of campsite owners: overall impression of the campground, staff training for both recreation and aquatics staff, noise, and fees and charges. The impacts of these items varied depending upon user group.

Introduction

Woodhaven Lakes Campground in Sublette, Illinois is America's largest ownership camping resort with over 6,000 campsites were sold. As the project was sold out by the developer, the ownership and management of the common areas of the resort was turned over to a nonprofit owner's association, "The Woodhaven Association." The association is managed by an elected board of directors who establish policy, set fees and hire staff. In order to be responsive to their owners, the board conducts periodic surveys of campsite owners. This survey is one such project.

Of general interest in this survey were questions about the current recreation facilities and programs as well as future development of recreational amenities, particularly winter and amenities (i.e., year round pool and spa, ice rinks, sledding hill etc.). Woodhaven was originally designed and sold as a seasonal operation but as time passed, interest has been expressed in developing the area into more of a year round operation, bringing with it a number of operating problems.

A special purpose of this study was to investigate factors impacting the satisfaction private campsite owners feel with the campground's recreation department using methodology developed in previous satisfaction studies done on boaters by Graefe and Drogin (1989), Drogin, Graefe and Titre (1990), and Holdnak, Graefe and Drogin (1992). These studies are based on the Expectancy Theory of Satisfaction.

Methodology

The study explored a number of potential impacts on campsite owners' satisfaction with Woodhaven Lakes Campground, Sublette, Illinois. Campsite owners were surveyed by mail in the summer of 1992 as part of a regular program of surveys conducted by the campground management organization. Since the primary source of funding for development and operations is membership dues, it was of particular importance to management to give each owner the opportunity to respond to the survey. Thus approximately 6,000 surveys were mailed to campsite owners and 1249 usable surveys were returned yielding a return rate of slightly better than 20.8%. Managers reported that this response rate was consistent with responses rates of their previous surveys. Due to the large numbers of surveys mailed, follow-up mailings were not used. Researchers recognize that this is a low response rate and that a random sample method with follow-ups might provide superior data.

Factors expected to impact satisfaction with the campground recreation department were developed by the campground recreation department staff with input from the researcher. Factors included: the overall impression of the campground operation, crowding, noise, fees and charges, as well as staff friendliness and training, facility supervision and facility condition for both recreation operations and aquatics operations. A series of items measured on a five point Lykert scale were used to assess the level of agreement with statements concerning each item. Items measuring crowding and noise were reverse coded. Overall satisfaction with the recreation department was measured with a single item on a ten point scale, where 10 = "extremely satisfied". A stepwise multiple regression analysis was conducted testing the impacts of the study variables on the satisfaction of the campsite owners. This methodology is consistent the previously mentioned studies.

Results

In order to test the impact of the selected variables on overall satisfaction with the recreation operation, a stepwise multiple regression was run.

Results of the stepwise multiple regression indicated that five of the twelve variables studied did impact the owners impressions of the recreation department (Table 1). The higher the overall impression of the campground, the higher the satisfaction with the recreation operation. Also important was the perceived level of training of the recreation staff and the aquatics staff as well the perception that current fees and charges were appropriate. In addition, the noise of others at the facilities negatively impacted satisfaction. Overall, the multiple regression produced an R^2 of .488 which is comparable to previous studies.

An additional series of ANOVAs were run to see if any of the factors impacting satisfaction with the campground recreation department varied depending upon the user groups at the campground i.e., persons visiting as "individuals", "self and spouse", "immediate family with primarily children" and "immediate family with primarily grandchildren".

Though there was no significant difference between groups on their overall perception of the campground's recreation department, there were significant differences between groups on two of the variables found to impact the satisfaction with the department (Table 2). People who visited Woodhaven Lakes as "self and spouse" were lower in their evaluation of Woodhaven Lakes overall than were the other groups. Also, the impact of noise at the facilities was felt more strongly by those visiting as individuals or with spouses that by the groups visiting with children or grandchildren.

Table 1: Summary of multiple regression of selected variables on satisfaction of private campsite owners with campground recreation operations.

Independent Variable	r	Overall Impression of WHL Recreation Department Beta
Overall impression of Woodhaven Lakes Campground	.636	0.614
I avoided certain areas of the lake because of crowding.	-.003	
The noise at the facilities reduced my enjoyment.	.195	0.089
There is adequate supervision at recreation facilities.	.041	
There is adequate supervision at aquatics facilities.	.015	
The recreation staff is well trained.	.406	0.525
The recreation staff is friendly and helpful.	.049	
Recreation facilities are in good condition.	.044	
The aquatics staff is well trained.	.349	0.239
The aquatics staff is friendly and helpful.	.036	
Aquatics facilities are in good condition.	.044	
Current fees and charges are appropriate.	.278	0.159
Percent of Variance Explained (R square):	**.488**	

Table 2: The influence of "group" on selected impact variables

			Group				
		Grand Mean	Individ.	Self & spouse	Immed. Family	F Value	Signif.
Overall impression of WHL Recreation Dept		7.35	7.21	7.35	7.37	0.258	.773
	N=	979	88	360	531		
Overall impression of WHL Campground		**7.57**	**7.72**	**7.33**	**7.71**	**5.509**	**.004**
	N=	1027	90	391	546		
The recreation staff is well trained.		3.73	3.7	3.75	3.73	0.191	.826
	N=	955	79	350	526		
The aquatics staff is well trained.		3.82	3.71	3.78	3.86	2.391	.092
	N=	941	78	338	525		
Current fees and charges are appropriate.		3.44	3.48	3.5	3.4	1.282	.278
	N=	926	77	337	512		
The noise at the facilities reduced my enjoyment.		**3.09**	**2.87**	**2.86**	**3.28**	**13.53**	**.000**
	N=	938	77	345	516		

Discussion

This results of this study indicate that the expectancy theory of satisfaction can be valuable in the evaluation of campground recreation operations. By focusing on the factors shown to significantly impact the impressions of campsite owners, recreation managers can most efficiently improve the owners satisfaction with their operation.

Of particular note in this study was the relative importance of training for both the recreation and aquatics staff. Training was found to be significant while friendliness and quality of supervision was not. For this operation, additional staff training programs would seem to be appropriate.

Additionally, the respondents feelings about fees and charges impacted their overall satisfaction. Further studies of willingness to pay should be conducted at this campground.

The methodology used in previous satisfaction studies was shown to be applicable in the study of campground operations. Additional uses of this methodology in a variety of public and private outdoor recreation operations should be conducted.

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RECREATION CONFLICTS ON MT. EVANS

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This study examines recreation conflict at Mt. Evans, Colorado; a high visibility area that attracts both hunters and non-hunters. Two types of conflict were distinguished: goal interference and conflict in values. Data were obtained from a series of on-site and mailed surveys. For *hunting related events* (e.g., seeing an animal being shot, hearing guns being fired), 70% or more of both hunters and non-hunters experienced no conflict. Among non-hunters, conflicts in values (between 24 and 27%) were more evident than goal interference problems (1 to 5%). For the hunters, less than 15% reported either goal interference or conflict in values. For *human/wildlife interaction events* (e.g., people disturbing wildlife, people feeding wildlife), between 40 and 68% of the non-hunters experienced no conflict, compared to 24 to 57% of the hunters. Twenty-one to 36% of both groups expressed a conflict in values. Hunters were more likely to report goal interference conflicts (19 to 55%) than non-hunters (6 to 36%). The management implications of these findings are discussed.

Introduction

Mt. Evans is a 14,150' mountain located 70 miles west of Denver, Colorado. The mountain is unique in that it has the highest paved road in North America, climbing almost 7,000 feet to the summit. The road offers visitors a variety of scenic landscapes, ranging from lakes and pine forests, to alpine tundra and snowcapped mountains. Mt. Evans also supports one of the most accessible mountain goat and bighorn sheep populations in North America, providing excellent opportunities for both wildlife viewing and hunting.

Because Mt. Evans accommodates a variety of user groups, conflicts can occur. Management strategies to mitigate the potential for these conflicts requires an initial understanding of the causes of conflict. At least two sources of conflict are noted in the recreation literature. Conflict may occur when the behavior or physical presence of an individual (or group) interferes with the recreation goals of another individual (or group). For example, a person attempting to photograph wildlife is likely to experience conflict if the animal is scared away by the arrival of other visitors at the site. This type of conflict is labeled "goal interference" because the goal of the recreation activity is inhibited in some way (Jacob and Schreyer 1980). A second type of conflict occurs when people holding disparate values about how an area should be managed share the same resource. These situations are labeled "value conflicts" (Williams 1993). Such conflicts in values are likely to result independently of actual contact between the groups.

Understanding these sources of conflict is important for wildlife managers because the solution to conflict depends on the cause of the problem. Zoning, for example, may reduce conflicts stemming from goal interference because the user groups are physically separated. On the other hand, zoning is likely to be ineffective when conflicting values are involved (Ivy et al. 1992, Owens 1985). Because social contact is not necessary for this type of conflict to occur, physically separating users will have little influence. In these situations, education may be more effective.

Recognizing the potential for conflict on Mt. Evans, the Colorado Division of Wildlife (CDOW) initiated a series of actions to elicit public opinion regarding acceptable management strategies. The first step was to recognize that there is no single public. Rather, the public can be segregated into a number of groups or publics; for example:

(1) recretionists [e.g., wildlife viewers, wildlife photographers, campers, hikers, hunters, anglers],
(2) regional residents,
(3) special interest groups, and
(4) agency personnel.

Separating the general public into homogeneous groups promotes a more systematic evaluation of the management alternatives preferred by different segments of society. The fundamental cause of today's contentious natural resource issues is the clash among incompatible values held by different publics (Vaske et al. In press, Manfredo et al. In press).

Once the publics were identified, mechanisms which facilitated input from diverse interests were established. Just as there is no single public, no single public involvement format can reach all potentially affected individuals. Consequently, a range of alternative techniques was used, including open houses in a variety of locations, stakeholder meetings, and letters to interested individuals soliciting their input. Individuals who attend public hearings or respond to direct mailings, however, may not be representative. To increase the range of contact with other interested parties, a series of scientific surveys were conducted: 1) an on-site survey and 2) three mailed surveys. One of the goals of these surveys was to systematically examine the frequency and magnitude of the occurrence of the two types of conflict on Mt. Evans. This paper summarizes findings from this investigation.

Methods

The On-Site Surveys

The objective of the on-site survey was to gather information from individuals who currently use Mt. Evans. The one-page survey included questions on the reasons for visiting, perceptions of problem conditions, if any, and reactions to alternative management scenarios. Data were collected on 11 randomly selected days between June and September, 1993. The sampling strategy included 4 days during hunting season to allow examination of potential goal interference conflicts.

Surveys were distributed by a team of interviewers to visitors at Echo Lake, Mt. Goliath Research Natural Area, and Summit Lake. An attempt was made to survey all visitors in the area during the data collection periods. Ninety-six percent of the visitors contacted (n = 986) completed the survey. Individuals who were willing to participate further were mailed a follow-up survey.

The Mailed Surveys

A 12-page questionnaire was mailed to all 600 Mt. Evans visitors who had provided their names and addresses on the on-site survey. Three separate mailings were used, with a reminder postcard after the first mailing. Of the 600 surveys in the initial mailing, 13 were undeliverable due to incorrect address information. A total of 401 completed surveys were returned (response rate: 401/587 = 68%).

Surveys were also mailed to Mt. Evans hunters and individuals who reside in the Mt. Evans region. The sample of hunters included those individuals who had applied for a 1993 permit to hunt elk on Mt. Evans and those who had applied for a sheep, goat, or ptarmigan hunting permit between 1988-1993. The range of years was used to ensure a sufficient sample of the different types of hunters. Mailing procedures paralleled those for the

visitor sample. Of the 600 hunter surveys initially mailed, 569 were deliverable and 389 were returned (response rate = 68%). The sample of regional residents (n = 600) was identified through local telephone directories. Of the 542 deliverable regional surveys, 199 were returned (response rate = 37%).

Combining the completed returns from all three samples resulted in a total sample of 989 individuals. Of these, 135 respondents had never visited Mt. Evans. Because this paper is concerned with conflict perceptions reported by Mt. Evans visitors, the 135 non-visitors were excluded from the analyses presented here.

Independent Variable
Respondents to all three surveys were classified as either hunters (n = 434) or non-hunters (n = 420). Hunters included those who currently hunt; non-hunters were individuals who have never hunted or who no longer hunt.

Dependent Variables
Respondents were asked to answer two sets of questions regarding 6 events. In the first set of questions, individuals indicated how frequently each event had happened to them personally during all of their visits to Mt. Evans. The events included three non-hunting situations (seeing people feed wildlife, people disturbing / harassing wildlife, and dogs chasing wildlife), and three hunting associated incidents (seeing hunters, hearing guns being fired, and seeing an animal being shot). Response categories were "never," "once," "twice," "3-5 times," and "> 5 times". For the purposes of this analysis, responses were recoded as either "observed" or "did not observe" the event. In the second set of questions respondents evaluated the extent to which they perceived each of the 6 events to be a problem at Mt. Evans. Responses were initially coded on a 4-point scale, ranging from "not a problem" to "extreme problem." These variables were recoded into two categories ("no problem" and "problem"). Problem situations included "slight," "moderate," and "extreme" problems.

Results

Combining the frequency of occurrence (observed versus not observed) variables with the corresponding perceived problem (no problem versus problem) variables for each individual produced a series of new variables; each with four possible attributes. Individuals who had either observed or did not observe a given event, yet did not perceive it to be a problem were considered a no conflict group (either in values or goals). Those who had never seen a particular event at Mt. Evans, but believed a problem existed for that event were expressing a conflict in values. Conversely, those who had witnessed a particular situation and believed that the event had caused a problem were indicating a goal interference conflict.

Columns 1 and 2 of Table 1 represent a "no conflict" group for hunting associated activities. These individuals, independent of whether they observed or did not observe an event, did not feel a problem existed. At least 70% of the non-hunters and 85% of the hunters were included in this no conflict category.

Table 1. Hunting associated conflicts on Mt. Evans.

	Not at all a Problem[2]		Problem[3]	
Event[1]	Did not Observe	Observed[4]	Did not Observe	Observed[5]
Seeing an animal being shot				
Non-hunters	71%	1%	27%	1%
Hunters	49	38	7	6
Seeing people hunting				
Non-hunters	70	3	24	3
Hunters	24	61	1	14
Hearing guns being fired				
Non-hunters	65	5	25	5
Hunters	28	59	3	10

[1] All comparisons between hunters and non-hunters are statistically significant ($p < .001$).
[2] No conflict groups
[3] Problem condition = slight, moderate, or extreme
[4] Conflict in values
[5] Goal interference conflicts

Columns 3 and 4 of Table 1 illustrate the two types of conflict. Responses in column 3 represent those individuals who did not observe the event but evaluated the situation as a problem (i.e., conflict in values). About one quarter (24 to 27%) of the non-hunters expressed this type of conflict for the three hunting associated variables. Only between 1 and 7% of the hunters indicated a conflict in values. Respondents in column 4 (Table 1) observed the event and thought it was a problem. These goal interference conflicts rarely occurred on Mt. Evans. Five percent or less of the non-hunters experienced these types of goal interference, while 6 to 14% of the hunters noted these problems.

Table 2 examines the same types of conflict for non-hunting human/wildlife interactions. In general, the non-hunters were more likely to have observed these events as opposed to hunting related situations. Twenty-one percent had seen people disturbing wildlife and 47% had seen others feeding wildlife (columns 2 and 4). For these variables, between 40 and 68% of the non-hunters fall into the no conflict category (columns 1 and 2). Between 24 and 57% of the hunters were represented in this no problem group.

Table 2. Human/wildlife interaction conflicts on Mt. Evans.

Event[1]	Not at all a Problem[2]		Problem[3]	
	Did not Observe	Observed	Did not Observe[4]	Observed[5]
Dogs chasing wildlife				
Non-hunters	67%	1%	26%	6%
Hunters	55	2	24	19
People disturbing/harassing wildlife				
Non-hunters	43	1	36	20
Hunters	28	2	35	35
People feeding wildlife				
Non-hunters	29	11	24	36
Hunters	17	7	21	55

[1] All comparisons between hunters and non-hunters are statistically significant ($p < .001$).
[2] No conflict groups
[3] Problem condition = slight, moderate, or extreme
[4] Conflict in values
[5] Goal interference conflicts

With respect to conflict in values (column 3, Table 2), about a quarter of the non-hunters felt that dogs chasing wildlife and people feeding wildlife were problems even though they did not observe the events. Thirty-six percent of the non-hunters expressed a value conflict with people disturbing or harassing wildlife. Among the hunters expressing conflict in values, the comparable percentages were 21% (feeding wildlife), 24% (dogs chasing wildlife) and 35% (people disturbing / harassing wildlife).

For non-hunting human/wildlife interactions, goal interference conflicts were more pronounced for hunters than non-hunters (column 4, Table 2). Between 19 and 55% of the hunters, compared to between 6 and 36% of the non-hunters reported goal interference problems. For both groups, people feeding wildlife presented the most serious problem.

Discussion

For hunting related events, conflicts in values were more evident for non-hunters than hunters. Goal interference for these events was noted by fewer than 15% of either group. For human/wildlife interaction events, between 21 and 36% of both groups experienced conflicts in values. Goal interference for these non-hunting situations were more likely to be judged problems by the hunters than the non-hunters.

Two general strategies have been recognized for dealing with conflict: zoning and education. When the conflict stems from differences in values, zoning is not likely to be very effective. For hunting events at Mt. Evans, physically separating hunters from non-hunters will not resolve the conflict in values expressed by the non-hunting group. Just knowing that people hunt in the area results in the perception of conflict. In this situation, education efforts designed to inform non-hunters about wildlife population management may be more effective.

Most research on goal interference conflicts has focused on the asymmetrical relationships between different activity groups, particularly between participants using motorized versus non-motorized equipment. Several studies conducted in the Boundary Waters Canoe Area, for example, have documented the presence of a one-way conflict between paddling canoeists and motorboaters (Lucas 1964, Lime 1975, Adelman et al. 1982). Paddling canoeists disliked motorized visitors, but the people using motor-powered craft were not bothered by the other group. Schreyer and Nielsen (1978) found similar results among western river floaters. Asymmetrical antipathy has been shown between hikers and trailbikers (Lucas 1964), oar-powered and motor-powered whitewater rafters (Shelby 1980), cross-country skiers and snowmobilers (Knopp and Tyger 1973), and backpackers and horsemen (Stankey 1973, Watson et al. 1993). In these situations, zoning is likely to be effective.

The non-hunting goal interference conflicts noted in this study represent reactions to inappropriate behaviors (e.g., feeding or harassing wildlife) as opposed to differences in types of use. Because these behaviors are not managerially acceptable, zoning is not a viable option. Resolution of these conflicts will require a combination of efforts, including: increased law enforcement, expanded education programs and the posting of signs.

The Mt. Evans public involvement process represented one factor which must be weighed in the decision making process. The goal of this public involvement was to reach better decisions by making the manager aware of the range of alternatives. Better decisions can be made by not leaving out or alienating groups who, if ignored, will resort to traditional political and legal mechanisms to make their wishes known. The procedures followed here allowed input from a wide range of publics using 6 different techniques (direct mailings, public meetings, an open house, stakeholder meetings, an on-site survey, and three mailed surveys). Also evident here, however, is the fact that public involvement *does not* make the decision *easier*. If anything, successful public involvement makes decisions more difficult because it alerts managers to the complexities of working with more than one constituent group.

It must be remembered that public involvement is more than public relations (Heberlein 1976). Public involvement is not selling the public on a particular program or plan. It is honestly and openly soliciting public help in the development and selection of alternatives. Public involvement is not a means of achieving a consensus among different groups, but rather a set of procedures to determine what the various preferences are and who holds those preferences.

The data reported here provide a systematic view of the types of conflict existing on Mt. Evans. Resolution of these conflicts in values can only occur through continual discussions with the different interest groups. Periodic contact must be made with these individuals and groups even if there is little new information to communicate. Regularly established meetings and / or newsletters show the relevant publics their ideas are not being dismissed. This feedback to the participants is vital for the success of any public involvement effort.

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Travel and Tourism



SELECTED LEISURE LIFESTYLES OF RESIDENTS IN RURAL TOURIST AND NON-TOURIST COMMUNITIES IN MASSACHUSETTS

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The *Lifestyle Zip Code Analyst* was used as a secondary data source to compare selected lifestyle characteristics of the adult populations in 21 tourist and 45 non-tourist towns in the Commonwealth of Massachusetts. Towns were rural in nature, with populations under 25,000. All tourist communities within the state were included in the survey. Non-tourist communities were randomly selected from towns with populations no less than 2,500 and no more than 25,000 in size. Adult participation rates were found to be higher for a number of leisure/culturally related activities in tourist communities. For other activities, little or no differences were found.

Introduction

In recent years, there has been a concerted effort to attract tourists in communities that have not always been known as tourist destinations. At the same time, efforts to stimulate even more tourism activity have been increasing in areas that have been established as tourist destinations for some time.

Considerable research has been conducted which has attempted to identify the impacts of tourism at the community level. Not all of the findings were encouraging. For example, the early work of Pizam (1977), Pizam and Pokela (1978) and Klar, Keegan and Warnick (1985) found negative relationships between tourism and various quality of life factors. These studies aside, much of the early research tended to focus on economic rather than social variables; it is more recently that research having to do with the social effects of tourism has increased (Ap, 1990). A number of those studies have generally found tourism to be related to positive factors such as certain quality of life indicators and residents' satisfaction with the presence or growth of tourism in their particular communities (Milman and Pizam, 1988; Long, Perdue and Allen, 1990; Klar, Warnick, Byrd and Pakkala, 1993; and Allen, Hafer, Long and Perdue, 1993).

What does not appear in the literature, however, is research that examines the lifestyles of the citizens who reside in high-tourism communities. Are there differences in the leisure lifestyles of adults living in tourist and non-tourist communities? Is the quality of life richer in one setting than another? Does the presence of tourism in a community stimulate participation in leisure activities, depress it, or have no effect at all? While only the surface of the issue could be scratched, such questions were the focus of this study.

Method

The *Lifestyle Zip Code Analyst* (1991) was used as a secondary data source to compare selected lifestyle characteristics of the adult populations in 21 tourist and 45 non-tourist towns in the Commonwealth of Massachusetts. Specifically, adult participation rates were compared for the following activities:

Avid Book Reader	Hike and Camp
Bicycling	Run/Jog
Cultural Activities	Self-Help
Current Affairs/Political	Skiing
Fishing	Sports on TV
Fitness	Tennis
Gardening	Walking
Golf	

Tourist communities were selected on the basis of lodging and food establishments and the presence of entertainment facilities and obvious tourist attractions.

Results

This study attempted to identify possible relationships between the presence of tourism in rural communities and the leisure lifestyles of their residents. With the exception of watching sports on television, it was expected that participation in all activities would be higher in tourist communities if, in fact, tourism and enhanced quality of life indicators are related.

Mean participation rates in non-tourist communities were higher for only the four activities of hiking and camping, fishing, watching sports on television, and skiing (Table 1). With the exception of hiking/camping, the differences were not noteworthy.

Table 1. Higher mean percent participation in non-tourist communities.

Activity	Non-Tourist	Tourist	Difference
Hike and Camp	17.2	24.0	-6.8
Fishing	18.7	20.2	-1.5
Sports on TV	33.6	34.5	-0.9
Skiing	14.1	15.4	-0.8

Mean participation rates in the other activities were higher in tourist communities (Table 2). The most striking differences were in gardening and involvement in cultural activities. Differences were also high for walking, avid book reading and involvement in current affairs and politics.

Table 2. Higher mean percent participation in tourist communities.

Activity	Non-Tourist	Tourist	Difference
Gardening	42.9	31.3	11.6
Cultural Activities	25.8	14.8	11.0
Walking	46.9	38.4	8.5
Avid Book Reader	47.3	40.6	6.7
Current Affairs/ Political	21.4	15.3	6.1
Bicycling	19.1	15.4	3.7
Tennis	9.4	6.1	3.3
Run/Jog	12.0	10.2	1.8
Self-Help	15.6	14.4	1.2
Golf	19.3	18.5	0.8
Fitness	32.9	32.6	0.3

Since involvement in cultural activities is generally associated with a high quality of life, that particular activity was examined on a town by town basis (Table 3). Two figures are reported. The first column is simply the participation rate expressed as a percent of the total adult community and the second is the index compared to the norm for the United States as a whole where 100 is the average. Thus, participation in Lenox is 159% greater than for the country as a whole while in Dighton the rate is 42% below the national average.

Table 3. Cultural activity comparisons.

Non-Tourist			Tourist		
High Group	**Pct**	**Index**	**High Group**	**Pct**	**Index**
Wellfleet	28.6	181	Lenox	41.0	259
Nahant	27.0	171	Deerfield	40.2	255
Montague	26.6	168	Stockbridge	38.3	243
Orange	23.3	148	Williamstown	35.1	222
Sheffield	22.5	142	Provincetown	31.8	202
Essex	21.3	135	Nantucket	30.3	192
Ipswich	21.2	134	Chatham	27.0	171
Williamsburg	20.5	130	Orleans	26.3	166
Hatfield	20.2	128	Rockport	26.2	166
Northfield	19.7	125	Newburyport	25.3	160
Dalton	18.0	114			
Low Group			**Low Group**		
Dighton	10.8	68	Dennis	25.2	161
Millbury	10.5	67	Lee	24.6	156
Spencer	10.0	63	Brewster	24.2	154
Whitman	9.9	63	Edgartown	24.0	152
Ware	9.7	62	Sturbridge	22.1	140
Uxbridge	9.6	61	Oak Bluffs	19.6	124
Athol	9.3	59	Eastham	19.2	122
Blackstone	8.7	55	W Yarmouth	18.9	119
Acushnet	8.4	53	Bourne	16.7	106
Templeton	4.7	30	Adams	14.5	92

Involvement in cultural activities was clearly greater in tourist communities, whether comparing the high groups or low groups. In fact, with the exception of Adams, participation in every tourist community was above the national average while participation in all non-tourist communities in the low group was well below the norm.

Discussion

According to these findings, participation in selected leisure activities was higher in rural Massachusetts towns categorized as tourist communities than non-tourist communities for gardening, involvement in cultural activities, walking, avid book reading and being involved in current affairs and politics. To a lesser extent, participation was also higher for bicycling and tennis. Hiking/camping participation rates were found to be somewhat higher in non-tourist communities. For the remaining activities, the differences were small or virtually non-existent.

Participation rates in tourist communities for certain activities were clearly greater; however, this does not mean that the presence of tourism causes adult participation rates to be higher. Instead, the nature of tourism in these communities may be such that these tourist towns attract people who are more educated, more politically active, and more culturally aware than individuals residing in other rural towns in the state. If that is so, it suggests that the presence of certain kinds of tourism activities contributes to the quality of life and "livability" of communities, at least in rural settings.

It would be helpful to examine rural communities which promote other types of tourist activities. For example, in Massachusetts the types of tourist activities that are "typical" emphasize the historic features of the area, numerous cultural events, especially music and dance, and the many activities associated with the North and South Shores, Cape Cod and the Islands, and the Berkshire Mountains. The quality of life in other types of tourist towns may be quite different if the tourist attractions take on a different flavor. For example, the characteristics of adults living in towns with such tourist attractions as theme parks, gambling or sports may be quite different from those living in the tourist communities in this study.

It may be that the criteria by which tourist communities are selected should be refined. For example, the towns of Wellfleet, Nahant and Ipswich clearly attract many tourists, yet did not meet the criteria primarily due to the lack of food or hotel facilities. These communities are clearly in a high tourism region. Had they been classified as tourism communities, the differences between the two groups would have been even greater.

It would be useful to control for income, education and length of residence, as well as changes in the number and type of tourist attractions in each town. For example, it would be particularly appropriate to identify changes in tourist attractions over the past ten to fifteen years and changes in each town's residents by education . Theoretically, tourist communities have will have attracted more highly educated, culturally inclined individuals. Furthermore, in addition to tracking secondary data, it would also be valuable to identify the primary reasons new individuals selected their respective communities as their place of residence.

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RURAL INFLUENTIALS' PERCEPTIONS OF TOURISM AND ITS POTENTIAL FOR ECONOMIC DEVELOPMENT: A QUALITATIVE STUDY [1]

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Rural residents' perceptions of tourism and its associated impacts are likely to be important in planning, development, marketing, and operation of existing and future tourism projects. This study examines rural influentials' perceptions of tourism as a tool for economic revitalization in Pennsylvania's rural counties, its present impact, and its potential for rural economic development in the future.

Introduction

Tourism significantly contributes to the economy and consequently has become an important element in the economic bases of many states and their local communities. Whether the tourism industry prospers or declines is of great concern to these states and communities (Economic Research Associates 1989; Federal Task Force on Rural Tourism 1989; Long 1991) and this concern is especially strong in rural communities that continue to lag behind urban areas in terms of higher education and health care (LeDuc 1991), employment rates, job growth, median family income, and equality of housing (Flora and Christenson 1991), and many other public services (Willits, Bealer and Crider 1982).

Tourism development is presently being endorsed as a viable economic development strategy to diversify a rural community's economic base and therefore potentially contribute to economic stability (Hunt 1992; LeDuc 1991; Long and Nuckolls 1992). Such a strategy can help rural communities address the multitude of problems facing them in the modern world (Brown 1992; Stokowski 1992). Tourism as a development industry can create recreational uses for the natural and man-made amenity resources of a rural community and convert these into income producing assets (Siehl 1990; Willits 1992). Visitors from outside the immediate community, county, or state can introduce outside money into rural areas through tourism-related spending. Tourism is a source of jobs, income, and tax revenues. Tourism can employ both managers and unskilled, entry-level workers, provide opportunities for small business development, and support a variety of service-related businesses. Through tourism, income is redistributed, often from affluent urban and suburban residents to service providers in rural communities. Tourism is generally perceived as being a "clean" industry with few serious environmental impacts, especially when compared to the resource extractive industries on which rural communities have been traditionally and often solely dependent (Grambling and Freudenburg 1990; Marchak 1990; McCool 1992; Robinson 1984; Weeks 1990). Furthermore, when a community refurbishes to attract tourists and focuses visitors' attention on the unique features of local heritage, architecture and scenery, a new sense of community pride on the part of local residents may result (Willits 1992). Rural tourism development can play an important part in the process of community development. Ideally, rural tourism development involves community action. Community members' support and involvement are important components for sustainable rural tourism development, for these local actions and interactions help ensure the protection and preservation of environmental and community amenities which are the foundation of tourism (McCool 1987). From an interactional perspective, local action in tourism development offers key opportunities for developing contacts within the community, leading to relationships between and among community members, and allowing for the natural emergence of other community networks (Burr and Walsh 1994; Wilkinson 1992).

There can be many benefits for rural communities and areas involved in tourism development initiatives and efforts. Tourism can help stabilize, diversify, and improve the local economies of struggling rural communities, help improve the quality of life in rural societies, and contribute to the overall process of community development. Because of the potential benefits, utilizing tourism as part of an economic development strategy for rural communities may make a lot of sense from the planner's and developer's point of view. However, consideration of resident perceptions of tourism and its potential for economic development are just as important.

Over the past twenty years, research has increasingly focused on the impacts of tourism on "host" communities. Most of the early studies focused on the economic aspects of tourism (Pizam 1978). This approach is still ongoing, especially with regard to rural tourism. As a rural economic development strategy, tourism is widely perceived as a potential basic industry, which brings in outside dollars to local communities and provides local employment opportunities, tax revenues, and economic diversity for rural communities (Perdue, Long and Allen 1990). More recent research attention has been given to the social effects of tourism (Ap 1990). The main reason for this attention is that residents' perceptions of tourism and its associated impacts are likely to be important in planning, development, marketing, and operation of existing and future tourism programs and projects (Ap 1992). Concerns about the impacts of tourism development on rural quality of life and the environment have created a significant demand for comprehensive planning, including assessments of local resident support for tourism development (Perdue et al. 1990). As a result, research has been generated which focuses on increasing understanding of local resident perceptions of tourism's economic, social, and environmental impacts. Overall, findings from this research suggest that there is very little difference in perceived tourism impacts by socio-demographic characteristics, that perceived impacts of tourism decrease as the distance between the individual's home and the tourism core of the community increases, and that the overall favorability of tourism impact perceptions increases with the individual's economic dependency on tourism (Milman and Pizam 1988; Murphy 1983; Perdue et al. 1990; Pizam 1978). It has also been suggested that resident attitudes of support for tourism development often emerge in response to the perception that local economic conditions are deteriorating (Perdue, Long and Gustke 1991).

Although our knowledge base of resident perceptions of tourism and its potential for economic development is developing, it is still limited. This is especially true for a sub-group of rural residents who may be identified as rural influentials. These rural residents are the leaders in rural communities, actively involved in decision-making and problem solving, and influential in the planning, development, and implementation of local policies, initiatives, and projects. Consequently, these rural influentials can affect the general perceptions of all rural residents.

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Purpose of the Study

The purpose of this particular study is to examine rural influentials' perceptions of 1) the extent to which tourism has played a role in the economic revitalization of Pennsylvania's rural counties, 2) the impact tourism has had on rural residents, communities, and the environment, and 3) the potential of tourism for rural economic development in the future.

Methodology and Research Design

Four Pennsylvania counties, each having a 1990 population that was over fifty percent rural, were selected from different geographic regions of the state for in-depth case studies of tourism's role as an economic development tool. Although geographic distribution across the state was an important factor in the selection of the counties, other variables were also of importance. These included some variation among the four counties in total land area, population, population density, population change, percent of the population considered to be rural, age composition of residents, per capita and median income, education, and current unemployment. Descriptive data for the four case study counties are displayed in Table 1. Also of interest were county variations in past and present dependence on tourism, current levels of tourism development efforts, different types of tourism present (e.g., natural resource, outdoor recreation, historical heritage, cultural heritage, special event), and both tourism-related and non-tourism-related economic development activity.

Table 1. Descriptive data for the four case study counties.

COUNTY[a]	County B	County G	County C	County S	PA TOTAL
Population	47,919	39,550	5,913	152,585	
County Seat Population	B-ville 3,137	G-ville 4,270	C-ville 2,513	S-ville 16,603	
Total Square Miles	1,017	577	398	782	
Population per Square Mile	46.0	70.2	16.8	205.5	264.3
% Population Change 1980-1990	2.4	-2.3	-11.4	-5.2	
% Population Rural	91.3	89.2	57.5	58.3	31.0
% Age Composition					
0-17 years	25.1	25.6	25.6	22.1	23.5
18-64 years	59.6	57.9	55.9	57.9	61.1
65+ years	15.3	16.5	18.5	20.0	15.4
% Female Pop.	51.1	52.5	51.1	51.8	52.1
% White Pop.	99.3	98.5	99.4	98.9	88.5
Per Capita Income	9,954	10,005	10,190	11,193	14,068
Median Income	25,335	25,284	24,006	29,041	34,856
% High School Degree	68.5	68.0	73.1	68.4	74.7
% College Degree	7.8	11.3	9.8	8.1	17.9
% Unemployment (4/93)	13.2	14.5	10.1	11.3	8.6

[a]Data are from the 1990 U.S. Census. Unemployment figures are from the Pennsylvania Bureau of Labor Statistics.

Within each county, key informant interviews were conducted with a wide variety of individuals who could be characterized as rural influentials. These individuals represented county, city, borough and township government, governmental agencies, and other public and private agencies and organizations. Other key informants represented certain media-oriented businesses, such as newspapers and radio. Although some of these individuals were professionally associated with tourism-related efforts and initiatives, such as an Executive Director of a Tourism Promotion Agency, most were not. Additionally, a modified "snowball" technique was employed through these key informant interviews to identify other individuals for further contact about local tourism-related efforts.

An instrument was developed for the purpose of interviewing key informants in the four counties. The interview instrument design was semi-structured and consisted of open-ended questions related to topics of interest. This was pilot tested in one rural county and after some minor modification of format was subsequently used in the three other counties. Overall, 53 key informant interviews were conducted in the four counties over a sampling time frame of approximately five months during the first half of 1993. Key informants considered to be rural influentials and interviewed for the study are displayed in Table 2.

Table 2. Key informants interviewed in the four case study counties. (N=53 for all key informants.)

County B Key Informants (N=14)
Executive Director, Office of Economic Development
Senior Planner, Office of Economic Development
Medical Professional and Community Activist
Borough Manager
Editor, Community Newspaper
Director of Planning, Office of Economic Development
Member, County Historical Society
Director, Chamber of Commerce
County Commissioners (2)
Director of Tourism Promotion Agency
Mayor, Small Town in County
Past President, Federal Retired Employees Association
Director, Retired Senior Volunteer Program

County C Key Informants (N=13)
County Commissioners (3)
Executive Director, County Chamber of Commerce
Executive Director, County Economic Development Office
Case Supervisor, Office of Human Services
Executive Director, County Tourism Promotion Agency
Marketing Director, Tourism Promotion Agency
Owner, Campground and Motel
State Park Manager
Owner, Local Radio Station
Publisher and Editor, County Newspaper
Executive Director, Community Action Corporation

County G Key Informants (N=15)
Director, Industrial Development, Inc.
Director, County United Way
Administrator, County Historical Society
Director of Health and Human Services
Director, County Parks and Recreation
Director, County Planning Commission
Editor and Publisher, County Newspaper
County Commissioner
Supervisor, Area Agency on Aging
State Park Manager
Owner and Artist, Art Gallery
Executive Secretary, Chamber of Commerce
President, Area Tourism Promotion Agency
Professor of Sociology in Higher Education
Borough Council Member

County S Key Informants (N=11)
Executive Director, County Visitors Bureau
Executive Director, Chamber of Commerce
County Commissioners (3)
Director, Economic Opportunity Cabinet
President, Economic Development Corporation
President, County Historical Society
Member, Community Betterment Association
State Park Supervisor
City Administrator

The raw data for this study are the field notes and tape records compiled from the key informant interviews conducted in the four rural counties. All field notes and tape records were transcribed into a standardized format in order to facilitate data analysis. The content of these transcribed interviews was then qualitatively analyzed by noting certain recurring themes, similarities, and differences which were evident.

Findings[2]

The study found rural influentials' perceptions of tourism and its potential for economic development to be extremely varied and mixed, although some common themes emerged. First and foremost, tourism was not recognized as being a major element in each county's economic base. When asked about the major elements and employers in the county's economy, the vast majority of the 53 key informants (72%) did not identify tourism or tourism-related businesses as major players. Key informants mentioning tourism as being a major element (28%) were for the most part professionally associated with tourism-related development and promotion efforts. However, ten of the fourteen key informants in County B mentioned tourism as being a major element in their county's economic base. In this particular county, the County Office of Economic Development and Tourism Promotion Agency were very active in heritage tourism development and promotion efforts as a result of substantial outside funding supporting regional tourism development projects. Although these efforts certainly contributed to a greater awareness of tourism among many key informants, these individuals were also aware that their perceptions of tourism and tourism development were of particular interest to the research project, having been notified of this fact by telephone and letter prior to their actual interview.

This methodology was changed for the remaining three rural counties where the key informants were informed that the research interviewer was interested in their perceptions of general strategies for rural economic development. Out of 39 key informants interviewed in these three counties, only five individuals (13%) mentioned tourism as being a major element in their county's economic base.

When specifically asked about the role of tourism in their county's economy, the vast majority of key informants (87%) felt that it did play a role, although perceptions about its economic importance ranged from tourism playing some role and being a viable force (45%) to tourism playing an extremely significant and increasingly important role (42%). Only 13% of the key informants felt that tourism played an unimportant or insignificant role. Additionally, tourism was often mentioned as being the basis for some local economic development and impact. Consequently, tourism was perceived by some as having a much more raised profile in terms of its actual economic impact and generating more economic development and activity in the future. However, as one informant stated, "We know it's here; we just don't know what the real impact is for our local economy." This appeared to be a recurring theme as several key informants mentioned the fact that it was difficult to actually measure and quantify tourism's impact and that there was a definite lack of supportive data. Although some informants were unsure about tourism's growth and a few perceived tourism as not being a future growth industry, the perception was evident that there is significant potential for future economic impact through tourism if certain resource and development constraints can be overcome. Some informants felt that rural residents were becoming increasingly aware of the benefits of tourism and consequently were much more supportive of tourism-related development. Other informants noted that it was difficult to make residents aware of potential benefits.

Key informant perceptions of tourism impacts on the county's residents, communities, and environment were again varied and mixed. Although more informants perceived tourism as making an important impact with positive economic benefits (24 responses), quite a few informants perceived tourism as having minimal or no impact (18 responses). Mentioned were the

2/ Due to the constraint of space, tables which detail summary themes and frequency of key informant responses are not included in this paper. These tables are available from the author by request.

opinions that tourism was not large-scale, that the numbers of tourists were insignificant, and that there was no tourism in the county. However, mentioned more frequently were feelings that people wanted tourism for economic development, that tourism brought new businesses to the area, increased the number of jobs and provided entry-level jobs for the unemployed and under-employed, and that construction of vacation homes provided work for local tradesmen. Of further interest were perceptions associated with tourism's contribution to the quality of life for rural residents. Because tourists are interested in visiting and are attracted to the resource amenities of these rural counties, local residents have become more aware of what they have and who they are. Thus, tourism is perceived as contributing to a positive self-awareness and self-image and has helped to develop local enthusiasm and pride. Many rural people want to keep their history and way of life going, see the potential for tourism to help them accomplish these, and consequently are willing to share these with visitors. One informant even mentioned that contact with outside visitors had stimulated the thought processes of the local residents. Additionally, tourism has resulted in more environmental awareness among rural residents, since a quality environment is the product of rural tourism. This has also resulted in better sites, attractions and tourism-related products.

Although eight informants responded that the results or impacts of tourism in the county had been all positive, other informants identified some negative impacts. Negative impacts ranged from increased litter and traffic to increased demands on the infra-structure and demands for services to some hard feelings existing between locals and visitors. However, these were all considered by the informants to be relatively minor as the scale of tourism in each county was relatively small. However, there was some concern that these could become more problematic for residents with future tourism development and the presence of increased numbers of tourists.

When asked what the future role of tourism is in the county's economy, key informant responses ranged through different levels of optimism, to being optimistic but dependent upon certain conditions being realized, to being pessimistic/negative, to not knowing or being unsure of the future. The vast majority of informants perceived the future role of tourism with optimism. Three-quarters of informant responses were optimistic. Strong proponents perceived tourism playing a very important, key role in the future and being perhaps the biggest contributor to the county's economy. Two informants in County C were strong in their opinion that tourism is the future of the county. Tourism was perceived as being a growth industry which will grow stronger in the future and provide good opportunities for businesses to grow and develop. Tourism was also perceived as being a complementary strategy for economic development which could help diversify the county's economic base. One-quarter of informant responses were pessimistic in nature and were related to perceptions that there were very few or no major attractions in the county to bring in tourists, that with respect to tourism, local residents were apathetic, lacked enthusiasm, and were resistant to change, and that there was a greater preference for the higher-paying jobs in manufacturing rather than low-pay tourism jobs. Two informants, one in County C and one in County S, did not know or were unsure about the future role of tourism.

Of the informants that were optimistic and/or hopeful about the future role of tourism in the county's economy, many of these opinions were dependent upon certain conditions being realized or certain barriers or constraints being overcome. Several themes are evident here. First, increased efforts must be directed to developing a more broad and diverse mix of attractions and activities for tourists, along with developing the necessary infrastructure and services to support increased numbers of tourists. Second, efforts must continually be made to increase both resident and government interest, support and involvement in tourism development at both county and local levels. This involves the development of better organization, leadership, and cooperation among interested and active parties, and more efforts to increase awareness among local residents about tourism's value, importance, and real and potential benefits. Two constraints identified were lack of available funding (or dependence on outside funding) and lack of available local knowledge and expertise to develop tourism successfully. Third, there is the important question of whether or not tourism development can be realized; of whether or not the rural county and its residents can capitalize on tourism based on available amenities which might be attractive to tourists. Fourth, it's important that tourism produces jobs for local people, but tourism development should be balanced, not over-commercialized, nor negatively affect the quality of life for rural residents. This is related to the fifth theme, that there is a need for effective planning for tourism and associated development and that this planning and development should not be imposed from outside the county so that local control can be maintained.

Discussion and Implications

The findings from this study have some implications not only for professional planners and developers involved in economic development and rural tourism, but for rural community leaders interested in developmental strategies which will help stabilize, diversify, and improve local economies, improve quality of life, and contribute to community development. It's important to be aware of rural influentials' perceptions of tourism and tourism-related development. As leaders in rural communities, these individuals are actively involved in decision-making and problem solving, and influential in the planning, development, and implementation of local policies, initiatives, and projects. Consequently, these rural influentials can affect the general perceptions of all rural residents. As this study has demonstrated, these individuals are sophisticated, perceptive and astute, and have strongly-held opinions and viewpoints about tourism. In order for tourism development initiatives and efforts to be successful, it's important to seek out and actively involve supportive rural influentials who are proponents and promoters of such development on the local level.

If tourism development is a viable economic development strategy helpful in diversifying a community's economic base and contributing to economic stability, it must be more readily recognized as being important and present by rural influentials and other rural residents. This requires more readily available supportive data about tourism's impact and real benefits at the local level and the development and implementation of strategies to diffuse such information throughout the rural populace in order to gain local support. Key informants who were the strong proponents of tourism perceived a great need to not only "educate" workers in the service industry about the importance of tourism, but to educate all rural residents about both the realized and potential benefits of tourism. Many informants felt that increased resident awareness would generate greater support for tourism and be manifested in greater hospitality extended to visitors and a willingness to absorb certain tourism-related costs or inconveniences.

The vast majority of informants perceived the future role of tourism with optimism and believed that there is a great to good potential for future tourism development. However, there were mixed perceptions about whether or not the potential would be realized or if tourism can be a major growth industry. It is obvious that increased efforts must be directed to identifying and developing a more broad and diverse mix or "cluster" of attractions and activities for tourists. This mix must then be effectively packaged and marketed to the tourists. Increased visitation will require the development and maintenance of the necessary infrastructure and services to support increased numbers of tourists. In addition to the need for more funding to support tourism development, one perceived problem seemed to be that even though some interest groups were active in certain tourism-related efforts, overall coordination and cooperation were lacking. Furthermore, volunteers were perceived to be the main participants in such efforts and consequently a lack of professionalism, limited progress, and difficulty in county-wide promotional efforts were all identified by informants as constraints. Also recognized were the need for professional

knowledge and expertise in tourism development and the need to include tourism as a component in any county-wide planning efforts in the future.

If federal, state, and local governments are concerned about improving and sustaining rural economies, improving the quality of life for rural residents, and making a viable contribution to the process of rural community development, resources should and could be allocated for rural tourism development where reasonable, perhaps as one component of a larger developmental strategy, and be directed to addressing the perceived constraints and barriers identified by these rural influentials. Rural influentials' support and involvement are important and vital components of rural tourism development, and their perceptions and efforts affect the more general perceptions and efforts of all rural residents. A greater recognition and understanding of these perceptions can help tourism-related planning and development initiatives be more effective in attaining set goals and in the process, benefit rural communities and their residents.

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TIME SERIES ANALYSIS OF TRAVEL TRENDS IN VERMONT

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Vermont's travel and tourism industry is not keeping pace with the nation-wide growth in the travel industry. While travel indicators such as domestic travel expenditures, tourism generated employment, payroll and tax receipts have been steadily increasing across the United States, these indicators in Vermont peaked in 1978 and have declined ever since. The state tourism industry experts have attributed this downward trend to weather, the cyclic nature of the U.S. economy, Canadian exchange rate, increasing state tax burden, size of state travel and tourism budget, and overall tourism industry competition.

This longitudinal study of tourism in Vermont from 1974-1991, refuted popular beliefs about what causes changes in Vermont's travel industry. Personal income, disposable income, size of the state travel and tourism budget, the state's travel generated taxes, full-time employment status, and gasoline prices had little effect on Vermont travel trends. The results indicated that increased competition in the travel and tourism industry has influenced Vermont's market share loss. This finding suggested that Vermont's mature travel market may not be keeping pace with the increase in other tourism related businesses that are capturing an expanding tourism market. That part-time employment status in New England has a negative association with travel indicators in Vermont. Finally, travel expenditures in Vermont are positively associated with a higher Canadian exchange rate, suggesting that travel to Vermont benefits from an active U.S. Economy.

Vermont Tourism Trends

Vermont's travel and tourism industry is not keeping pace with the growth nation-wide of the tourism industry. While travel indicators such as domestic expenditures, tourism generated employment and payroll, and tourism generated tax receipts have been steadily increasing across the United States, these indicators in Vermont peaked in 1978, and have shown a downward trend over the last 15 years (Figure 1). Tourism industry leaders in Vermont are just beginning to recognize this downward trend attributing it to such causes as weather, economic recession, the growing cost of doing business, and the Canadian exchange rate. Typically, however, they only perceive this downward trend as a five year phenomenon that corresponds to the recession of the late 1980s. Consequently, the industry feels it is only temporary, and many people expect tourism will be Vermont's #1 industry by the year 2000. The 15-year duration of this downward trend, however, suggests there may be different forces at work in the state's tourism industry besides a momentary downturn in the U. S. economy. The purpose of this paper is to examine the effects of weather, U. S. economic indicators, state advertising budgets, state tax burden, and competition on Vermont's travel and tourism indicators. The study uses time-series analysis to gauge whether the trends in Vermont are temporary or whether they have longer term implications.

This paper looks at the longitudinal effects of six types of measures that people have said affect Vermont's tourism indicators: weather, national economic indicators, the Canadian exchange rate, size of the state's advertising budget, the state's travel related tax burden, and industry competition. Each of these has been the subject of public discussion in Vermont's tourism industry. First, Vermont's tourism industry relies heavily on the skiing, which dominates tourism to Vermont for up to half the year. A 1993 survey (Kuentzel 1993) of winter visitors to Vermont showed that 81% of the sample's visitors to the state went skiing while they were here. Similarly, Bill Stenger of Jay Peak stated that when winter tourism declines, tourism to Vermont during the rest of the year is negatively affected "because so many tourism facilities in the state are driven by winter tourism" (Pyne 1993). So, when Vermont has a year with little snow, it should have a significant affect on tourism activity in the state. Second, the tourism industry in Vermont often attributes downturns in tourism related business to economic downturns. Leisure is often thought of as a luxury that is the first item of discretionary income cut back in times of economic uncertainty. Economic recessions create employment uncertainty and diminishing buying power, which directly affect travel spending. Third, closely related to economic conditions is the Canadian exchange rate. Vermont benefits from roughly 300 million dollars per year (about 20% of total expenditures) spent in the state by Canadians (Zentz 1994). Therefore, when the price of the dollar is high, Canadians are less likely to spend their money in the state. Fourth, the recession of the last several years stands out as the "down-sizing" recession. This event not only put small businesses in jeopardy, but forced significant down-sizing by large corporations, educational institutions, and government agencies. Vermont's Department of Travel and Tourism was level funded throughout the recession. Subsequently, there is a push to increase the department's budget to offset some of the crisis that the industry now is beginning to perceive. Past research, however, (Hunt 1990) shows that the size of state travel budgets have little effect on travel indicators, and conversely, the lack of state promotion dollars should have no direct effect on declining market share. Fifth, legislators and travel industry people often point to a rising tax burden as a condition that discourages growth in the states tourism industry. An increase in the rooms and meals tax or the gas tax can give the impression that Vermont is no longer a travel bargain. Consequently, many people in the industry are concerned that increased state taxes may turn potential visitors away from the state. Finally, increased competition may be taking away former visitors to the state. More ski slopes with newer equipment, more tourism marketing organizations, and a greater variety of destinations may be cutting into what was once a stable and reliable tourism market for Vermont. Thus, this paper will test the effects of each of these variables on tourism expenditures, tourism generated employment and payroll, and tourism generated tax receipts in Vermont from 1974 to 1991.

Time-series Analysis in Tourism Research

Time-series analysis is a fairly new area of expertise in tourism research. Earlier trend analyses simply plotted measures and drew conclusions based on the visual and central tendency evidence. As the field of travel and tourism matured, the types of analyses have changed from use of basic descriptive statistics to increasingly complex multivariate quantitative analyses. Analyses of tourism trends are conducted for many reasons: for the researcher it may be out of curiosity, or the desire to forecast changes in the future; for businesses, states, and countries, it assists them in staying competitive in the travel and tourism market: and for practitioners it "provides useful guidance to those who plan for, provide, approve and fund..." tourism experiences (McClellan and Siehl 1989). The importance of generating accurate forecasts is particularly relevant for tourism. Archer (1987) points out that, "In the tourism industry, in common with other service sectors, the need to forecast accurately is especially acute because of the perishable nature of the product."

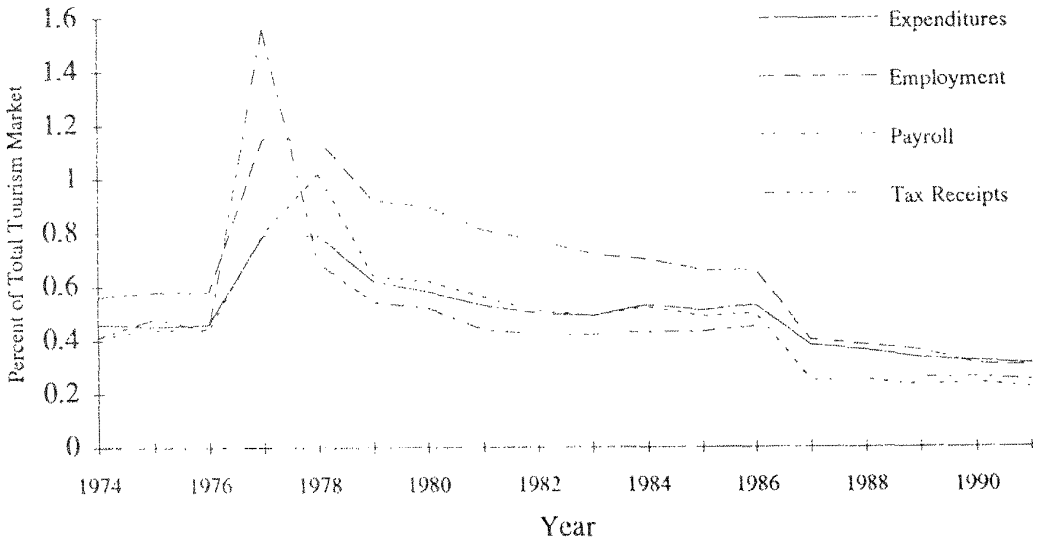


Figure 1. Vermont's tourism industry market share.

Two types of time-series quantitative analysis can be found in the literature -- regression models (Steinnes 1988, Johnson and Suits 1983) and forecast models (Sheldon 1993, Witt and Witt 1991). A forecasting model is typically a univariate analysis that uses the underlying pattern in the variable over time to model and extrapolate future trends. Regression analysis attempts to provide a causal explanation by using information on variables believed to influence the dependent variable. Hunt (1990) stresses the need for multivariate modeling of longitudinal tourism data. While it is easy to draw causal links between a single independent variable and the dependent variable, the researcher must be aware of the presence of other exogenous variables such as the overall economic conditions, weather, and competition, to name a few, that affect the nature of the impact of travel on the state.

Hunt (1990, p.11) also draws attention to one other limitation, i.e., lack of comparable longitudinal tourism data. At the state level, tourism has had support programs for the last 25 -50 years; however, compilation of comparable longitudinal tourism data has only been available since the 1970s with the inception of the U.S. Travel Data Center. The State of Vermont is just now realizing the importance of time-series analysis. The Vermont Department of Travel and Tourism has collected time-series data for many years. Its efforts, however, have been somewhat inconsistent. The consistent gathering of time-series indicators often falls by the wayside when tourism to the state is in a growth mode. Missing data points make an analysis difficult at best, and unreliable at worst. In any event, a formal time-series analysis of travel trends to Vermont has never been conducted.

Methods

Autoregression

This study uses a time-series regression analysis to investigate the trends in Vermont's tourism indicators between 1974 and 1991. The analysis seeks to determine the effects over time of weather, various economic measures, and market competition on domestic tourism expenditures in Vermont, tourism generated employment in Vermont, and tourism generated taxes gathered by Vermont's travel industry. Time-series data, however, presents a unique problem that ordinary least squares regression cannot handle. Time-series data characteristically has high levels of serial correlation. Serial correlation means that the best predictor of a value at time t is its measure at time $t-1$. A high value is usually not followed by a proportionately low value, but instead measures are highly correlated with their previous values. Stock prices are the classic example. The price of a share of AT & T stock does not close at $57 one day and $13 the next. Similarly most people's income tends not to fluctuate up and down drastically from year to year. This quality of serial correlation violates the assumptions of ordinary least squares regression. Autoregression is the statistical technique devised to handle the serial correlation problem that is inherent in time-series data (Ostrom 1978). Autoregression controls for the effects of autocorrelation in the regression equation and estimates effects of an independent variable on a dependent variable with the effects of serial correlation parceled out.

Sample Size

This analysis included 18 years of data on Vermont travel related indicators. The results of this analysis therefore must be interpreted with caution. The reason for caution is not statistical. Autoregression is able to calculate unbiased estimates with relatively small sample sizes such as this. Since longitudinal data on tourism is hard to come by, the data set represents the best available measures of tourism activity in Vermont. The reason for caution, however, is that small sample sizes may not represent actual trends. The travel and tourism industry in Vermont has been active for 175 years. Eighteen years of data may only reflect a momentary deviation in an otherwise clear trend. Consequently, 50 years or more of data would represent a more accurate picture of a time series. Nevertheless, the tourism literature states that the tourism industry has grown steadily in the U. S. since the end of World War II (c.f. Fridgen 1991). Therefore, a downturn in tourism activity in the 1980s to an established destination like Vermont raises questions that can be statistically tested within an 18 year time span.

Measurement

Dependent variables. This study used secondary data from a variety of sources. The dependent variables came from the U. S. Travel Data Center's series entitled *The Impact of Travel on State Economies*. The U. S. Travel Data Center's estimates of travel impacts uses what Flemming and Toepper (1990) call a aggregate model of economic impact. They use baseline indicators from a five year census of travel behaviors as constants in their model. They then input yearly secondary data on industry receipts and tax revenues and actual trip budgets from a yearly sample of travelers. Four variables from their series were included in the analysis: Vermont's domestic expenditures, travel generated employment (FTEs), travel generated payroll, and travel generated tax receipts.

Independent variables. The independent variables were taken from a variety of government sources. We used four measures of weather: annual snowfall (winter precipitation), annual rainfall (summer precipitation), average winter temperature, and average summer temperature (National Oceanic Atmospheric Administration). We averaged measures from Burlington (Champlain Valley), Mt. Mansfield (central mountains), and Bellows Falls (Southern Vermont) to create a statewide score for each weather variable. The study included three types of economic indicators. First were income statistics, including personal income, disposable income, and minimum wage (U.S. Department of Commerce 1989). Also included were labor statistics such as unemployment, full time employment, and part time employment (U.S. Department of Labor Statistics). We included overall measures of economic well being such as the consumer price index, inflation rate, and purchasing power of the dollar (U.S. Department of Commerce). Lastly, we included the average price of a gallon of gasoline. The study also used gathered data from different Vermont state agencies. The Vermont Department of Travel and Tourism supplied state tourism budgets along with the proportion of their budget that was devoted to advertising. The state tax department also supplied figures for the gasoline tax and the rooms and meals tax (Vermont Department of Taxes). Finally, the study used membership statistics from the National Tour Association that were itemized by the number of tour operators, the number of tour suppliers, and the number of tourism related marketing organizations (National Tour Operators 1993). In the analysis, current dollars were regressed with variables that were measured in current dollars; whereas any independent variable that was measured in either constant (1987) dollars or was not a dollar measurement was regressed with constant dollars.

Results

The results generally did not confirm popular beliefs about the causes of Vermont travel activity (Table 1). One common belief in the state is that snowfall has a big impact on travel to Vermont. Though there was not a "big" affect, snowfall was found to be positively related to travel generated payroll. Table 1 shows that the lack of snowfall did not negatively affect Vermont's domestic tourism expenditures, employment or tax receipts. Neither did average winter temperature or the average summer temperature. Though a weak relationship was found between the amount of rainfall and tax receipts. While weather may have an impact on daily or weekly tourism indicators at specific sites, it does not have a big affect on the states overall tourism activity over the course of a year.

Table 1. Autoregression estimates (Betas) of economic, weather, and competition variables on Vermont's travel indicators.

	EXPEDITURES		EMPLOYMENT		PAYROLL		TAX RECEIPTS	
	Beta	SE Beta	Beta	SE Beta	Beta	SE Beta	Beta	SE Beta
WEATHER								
Snowfall	1.79	1.54	0.065	0.049	1.00*	0.461	0.578	0.338
Rainfall	6.38	7.05	0.157	0.228	2.34	2.380	-0.476**	2.540
Winter Temp.	-13.88	8.86	-0.408	0.285	-5.76*	2.930	-3.72	3.080
Summer Temp	-13.88	13.60	-0.545	0.420	-0.485	4.620	-4.23	4.720
ECONOMIC IND.								
NE Per Capita Inc.	0.026	0.019	-.00076	0.00074	0.003	0.004	0.0020	0.0017
NE Per Cap. Dis. Inc.	0.030	0.022	-.00090	0.00085	0.003	0.005	-0.0024	0.0021
Minimum Wage 356.420* 83.63	3.10	6.96	66.18*	27.870	20.95	14.93		
NE F.T. Emp.	0.180	0.316	0.006	0.011	-0.102	0.077	-0.084	0.047
NE P.T. Emp.	-1.410*	0.470	-0.066*	0.013	-0.487*	0.151	-0.236**	0.123
NE Unemp.	-0.536	0.589	-0.014	0.019	-0.147	0.195	0.0053	0.166
CPI	-3.59	3.78	-0.166	0.136	-1.56	0.991	-1.01*	0.489
Purchase Power $	-91.14	308.73	0.932	10.87	23.30	86.28	35.23	40.52
Inflation	25.71	21.28	0.953	0.720	5.37	7.38	2.36	5.52
Ave. Gas Price	221.01	286.44	-5.85	11.79	65.89	66.97	-60.64	56.23
CANADIAN EXCHANGE								
Rate	1976.42	338.71	43.33	29.75	389.68*	130.66	136.81**	74.37
STATE TAX BURDEN								
Room and Meals Tax	0.006	0.007	-0.00034	0.0024	0.00069	0.0017	0.00071	0.00069
Gas Tax	0.014	0.012	-0.00047	0.0045	0.0017	0.0031	0.0015	0.0013
STATE TRAVEL OFFICE								
Dept. Budget	0.080	0.139	-0.0053	0.0049	0.011	0.033	0.015	0.014
Advert. Budget	-0.110	0.315	-0.014	0.011	-0.026	0.086	0.037	0.046
COMPETITION								
Marketing Org.	-1.13*	0.25	-0.047*	0.005	-0.379*	0.084	-0.081*	0.036
Tour Operators	-1.60*	0.47	-0.069*	0.010	-0.566*	0.122	-0.107**	0.057
Tour Suppliers	-0.338*	0.124	-0.011*	0.002	-0.129*	0.033	-0.019	0.014

*/ p< .05
** / p<.10

Another common belief is that tourism activity is subject to the cyclic swings of the U. S. economy. The results from the autoregression offer mixed support for this assertion. Table 1 shows that trends in Vermont's tourism indicators were not related to changes in the U. S. inflation rate, or the purchasing power of the dollar. Similarly, travel tends in Vermont were not related to all labor or wage statistics. Changes in personal income, average income, and disposable income had no effect on changes in tourism indicators. Similarly, full-time employment status and the unemployment rate had no effect on tourism activity in Vermont. Finally changes in the price of oil did not affect travel to Vermont. Only two labor statistics, part-time employment and minimum wage, were found to significantly affect Vermont travel indicators. A rise in the minimum wage was associated with a rise in domestic tourism expenditures in Vermont. CPI had a negative effect on travel generated tax receipts. Part-time employment had negative effect on all dependent variables.

The effect of the Canadian exchange rate on Vermont's travel indicators offer some evidence that tourism is related to the health of the U. S. economy, although the results were counter-intuitive to common beliefs in Vermont. Given the importance of Canadian visitors to Vermont's travel industry, many have stated that travel indicators in Vermont should decrease as the Canadian exchange rate increases. The results (Table 1) show a significant effect in the opposite direction. Tourism activity in Vermont increased with the increase of the Canadian exchange rate. A higher exchange rate is an indicator of increased economic activity in the U. S. Therefore, increased economic activity in the U. S. appears to be associated with increased travel to Vermont.

The results also did not support the "state level" arguments about what affects travel and tourism activity to Vermont. Increases in the state tax burden on visitors had no effect on Vermont's travel indicators. An increase in the gasoline tax (9¢/gallon in 1974 to 15¢/gallon in 1991) and an increase in the rooms and meals tax (5% in 1974 to 8% in 1991) had no effect on yearly travel generated expenditures, tax receipts, or employment. Thus, tax increases do not appear to drive away potential visitors to the state. The results also supported Hunt's (1990) findings that the size of a state's tourism promotion budget does not have a significant impact on travel expenditures. The size of the Vermont Department of Travel and Tourism's budget, and the proportion of that budget devoted to advertising had no effect on tourism expenditures, tourism employment, or tourism tax receipts.

Finally, the results showed that an increase in competition in the tourism industry nation-wide has a strong significant effect on tourism indicators in Vermont. Table 1 shows that an the increase in destination marketing organizations (i.e., membership in the NTA) tour operators, and tour suppliers nationwide (attractions, motels, gift shops, restaurants, etc.) had a negative effect on travel generated expenditures, employment and payroll in Vermont.

Discussion

Contrary to the Vermont travel industry speculations, the effects of weather, national economic indicators, size of state advertising budget, and relative state tax burden do not have a marked affect on tourism activity in the state. On the other hand, competition, Canadian exchange rate, part-time employment and minimum wage significantly affected tourism activity in Vermont.

With the increasing competition in the overall tourism industry, it is important to realize the affect that it has on Vermont's tourism industry. First, the increase of marketing organizations in the nation, are often associated with state tourism initiatives. It is apparent that the main source of competition is coming from other states and destination marketing organizations (DMO), who are capturing larger portions of the market share pie and making it increasingly difficult for Vermont to maintain its tourism industry. Currently, states are increasingly active in marketing and promotion of tourism regionally, nationally and internationally. According to Hawes, Taylor, and Hampe (1991):

> *the successful states have infrastructure of a tourist industry, and a number of strategies at their command, and they can meet the tourism demand with necessary local resources such as motels, hotels, restaurants, transportation, or information. A state such as Nevada, for example, focused on a particular type of tourist activity (gambling) and developed the necessary goals, strategies, and tactics.* (p.15)

These states, as Hunt (1990) says are "aggressive or bullish" in nature, and between 1977 and 1986 were able to gain $8.8 billion in market share. This means that certain states are gaining larger slices of the tourism pie at the expense of other states. The state of Vermont who has thrived as a travel destination for 175 years, and is now faced with the dilemma of loss of market share and needs to become a "bullish" player in this ever increasingly complex and aggressive market.

Second, the increase in tourism is further highlighted by the increase in tour suppliers (accommodations, attractions, restaurants, entertainment complexes, gift shops, etc.) This increase in tourism suppliers suggests that the state's more mature tourism market may not be sharing in the growth of the overall U.S. tourism industry. Lastly, the negative association of the number of tour operators that are affecting generated employment, payroll, and tax receipts also seems to supports the current trend of loss of market share by the State of Vermont. These variables, though limited to membership in the National Tour Operators Association, mirror the steady increase in three sectors of the travel industry and assist in realizing the possible ramifications of diverse and competitive tourism market.

This competitiveness is also present at Vermont's northern border, where intuitively with the increase in the Canadian exchange rate should decrease the number of cross-border visits by Canadians. In this study, that was not the case. The Canadian exchange rate did not directly effect tourism activity in Vermont even though Canadians help makes up 20% of tourism expenditures (Zentz 1994). Counter-intuitive to what is expected, a positive association between the Canadian exchange rate and expenditures was found. This says that with an increase in the rate of exchange, Vermont travel indicators also increases. This association represents an increasing strength of the dollar, which is in turn associated with the increased economic activity in the U.S. and hence increased travel activity in the state.

Additionally, as there is an increase in part-time employment in New England, there will be a negative affect on all tourism indicators in Vermont. New England is main source of tourism for Vermont, and a larger part time workforce may mean slower growth in total and disposable income in the region. If this is the case, New England income statistics may begin to have a significant negative effect on Vermont's travel industry in the near future.

Minimum wage was one of the only significant economic variables, but we think this finding is suspect. This effect can be explained by the nature of the trend of minimum wage which remained the same for the last 11 years. The high association with travel expenditures was due to steady increase in both variables in the 1970s and may not indicate any long term relationship between them. In addition, this variable would be more valuable if the number of minimum wage tourism jobs in the state were readily known.

This study was able to specify forces that work in the Vermont tourism industry over the last 18 years in order to understand a 15-year downward trend of loss of market share. There is however a need to recognize several limitations in the method of analysis and types of data used. First, the method of time series analysis of only 18 years of data could be limiting due to the possibility that small sample sizes may not represent actual trends. The 175-year history of Vermont's tourism trade may be relatively smooth and in actuality the 18 years may only represent a small bump in that trend line.

Second, the U.S. Travel Data Center data used in this study were estimated with the Travel Economic Impact Model (TEIM). This model has several limitations. First, the impact estimates fail to include two classes of travel generated expenditures: goods purchased in anticipation of travel (sporting equipment, travel books, language tapes etc.) and major consumer durable goods bought related to outdoor recreation (bikes, OHVs, snowmobiles etc.). Second, expenditure data is only recorded in a state if a person actually spends the night there or the state is the point of origin or destination. Third, model also excludes day-trips and travel less than 100 miles away from home. Finally, the expenditure data is collected through household surveys that carry sampling and non-sampling errors making estimates in smaller states less reliable (U.S. Travel Data Center 1992). Though all of these factors contribute to the potential for substantial error in the Vermont estimates, the error terms were distributed randomly across the years. This makes time-series analysis a suitable method of analysis of this type of data.

Conclusion

This study has used autoregression to analyze the causal factors that have affected trends in Vermont's travel industry between 1974 and 1991. The results refuted popular beliefs about what causes changes in Vermont's tourism generated expenditures, employment, payroll and tax receipts. Snowfall, rainfall, temperature, the Canadian exchange rate, personal income, disposable income, the state's travel generated taxes, employment status, and gasoline prices had little effect on Vermont's travel trends. The results did indicate that increased competition in the travel and tourism industry has influenced Vermont's market share loss. The state may be suffering from increased competition from other aggressive state promotion offices and destination marketing organizations. The mature state tourism industry may also not be keeping pace with the increase of other tourism related businesses that are capturing an expanding tourism market. Subsequently, this mature industry will not be able to compete with the growing number destinations that ten years ago were not even on the map. For the tourism planner in New England, this may indicate a need to become a more "bullish" player in the global tourism market through more creative and structured planning. Finally, travel to Vermont appears to benefit from a vital economy where U. S. dollars are more scarce and invested in an active economy.

Future time-series research should focus on maintaining consistent and reliable longitudinal data. More time-series observations will produce more reliable autoregression results. Research should also look more closely at the impact of Canadian travel on Vermont's travel related economy. Finally, this analysis needs more, and better, measures of industry competition, in order to determine where the state's promotional, demographic, and infrastructural shortcomings, and to focus its competitive efforts in directions that will capture a share of a growing travel market in the U. S.

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THE NEW ENGLAND TRAVEL MARKET:

CHANGES IN GENERATIONAL TRAVEL

PATTERNS

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The purpose of this study was to examine and explore the New England domestic travel market trends, from 1979 through 1991 within the context of generations. The existing travel markets, who travel to New England, are changing by age cohorts and specifically within different generations. The New England changes in generational travel patterns do not reflect national trends. Implications and discussion points were provided.
Keywords: Domestic travel, trends, New England, demographics, generations, generational marketing, and market implications.

Introduction

Evidence indicates that demographic shifts in the population age structure will affect many businesses and activities, especially tourism as the population ages and significant portions of the population have time to travel (Research Alert 1990). This will be particularly true as baby boomers reach older age cohorts. The distinct differences in travel-specific behavior and participation rates exhibited by changes over time will likely shape future demand for these activities. Recent studies (Warnick 1992B and 1993B) indicated that domestic travel in the New England has become a mature market. Rather than simply examine tourism travel trends by age cohorts, this study examines the generations as they cycle through time and relates their domestic travel behavior to the New England Region.

Purpose of the Study

The purposes of this research paper are three-fold: 1) to examine domestic travel to New England during the 80s and early 90s within the context of generations; 2) to determine how participation rates in domestic travel within individual age categories changed over time (from 1979 through 1991)? (Can watershed years be identified in a 13 year span?); 3) to determine how participation rates in domestic travel of generations changed as these groups passed from one age category into the next (i.e., from 25 to 34 in 1980 to 35 to 44 in 1990)? Will generational characteristics and personalities impact upon domestic travel?

Method

For the analysis of domestic travel, data for this study were compiled from the annual surveys conducted by Simmons Market Research Bureau, Inc. (1979 through 1991)[1]. This research firm annually measures participation rates, demographic composition and media use patterns of a wide variety of leisure, sport and travel activities. The sample sizes range from 15,000 adults sampled in the early 80s to over 21,000 adults sampled in 1990. The data were analyzed over the period from 1979 through 1991 using an average annual adjusted percentage change rate.

Other change rate factors were considered (weighted change rate, moving average, and least squares method); however, this method was selected due to its wide acceptance. Within this study only travelers who indicated that they traveled to New England were included. Excluded from this analysis were travelers who visited the New England from other countries.

The nature of domestic travel and participation requires the description of three major components of travel demand. First, domestic travel must be defined. "Domestic travel" is defined as "any trip(s) of over 100 miles (one way) within the continental 48 coterminous U.S. states taken in the previous 12-month period" (Simmons Market Research Bureau, Inc. 1991). This definition of domestic travel includes all types of travel taken which fits the mileage and regional description; but excludes all types of travel taken of distances shorter than 100 miles. Second, "market size" is the "number of people who participate in domestic travel." This statistic in and of itself it is somewhat less meaningful than a statistic which more specifically quantifies demand or travel volume. However, the nature of this data set does not easily allow a projection of the number of travel days to New England. Third, "participation rate" is the percent of total adults by descriptor (total U.S. population or age - such as 18- to 24 -year-olds) who elected to travel to New England for any reason as a primary destination during the pervious 12 months. In this study the geographic region definition of "New England" includes the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut.

Age cohorts in terms of the demographic patterns of travel include the following categories: 18 to 24; 25 to 34; 35 to 44; 45 to 54; 55 to 64 and 65 and older. Other groupings of age cohorts include young adults -- 18 to 34; middle aged adults -- 35 to 50; and mature adults -- 50 and older. The generations included were the GI Generation (born 1901 to 1924); the Silent Generation (born 1925 to 1942) the Baby Boom Generation (born 1941 to 1960); the Thirteenth Generation (born 1961 to 1981) and reference is made to the newest generation, the Millennial Generation (born since 1982). The Lost and Missionary Generations (both born before 1904) are referred to but are not a major portion of this study as they are now very few of these individuals who are active travelers. As generations move through time, they have been labeled and have been found to take recycle and within each generation a set of traits evolve or also cycle through time. Thus, as generations are added, they have been labeled "idealistic" like today's Baby Boomers, "reactive" like today's X Generation, "civic" like the older GI Generation or the youngest Millennial Generation, or adaptive like today's Silent Generation. Currently we are adding a civic generation as predicted by Strauss and Howe (1991) in the Millennial Generation. The cycle then is idealistic-reactive-civic-adaptive. Within each generation, such as the Baby Boom Generation, traits evolve over time. For example, Baby Boomers grew up being "indulged," then turned inward and became "narcissistic," and now are in a "moralistic" mode (note the move to "political correctness") and will eventually move into a "visionary" phase. These generations are based on the works of Strauss and Howe (1991). The cycle of generations and their specific generational traits have repeated over time since the 1500s and the authors expect these cycles to continue. Strauss and Howe's (1991) works defines these cycles through such concepts as social moments, secular crises, and social awakenings. For more details on the concepts of generations, generational cycles and generational traits, please see Strauss and Howe, 1991. The generations, their generation type name and their traits are listed below in Table 1.

1/ Permission to use the travel data base was granted by Simmons Market Research Bureau (SMRB), Inc. of New York for the purposes of this study. The interpretation of the data is the author's and SMRB is the source.

Table 1. Generation names, examples and traits.

Type	Generation Example	Generational Traits[a]
Idealist	Baby Boom	Indulged Narcissistic Moralistic Visionary
Reactive	Thirteenth / X	Criticized Alienated Pragmatic Reclusive
Civic	GI, Millennial	Protected (Millennial) Heroic Powerful Busy (GI)
Adaptive	Silent	Suffocated Conformist Indecisive Sensitive

[a]The current trait of the generation is underlined for each generation. Source: Strauss and Howe, 1991.

Age cohorts were fitted to the generations to examine the domestic travel behavior specific to the New England Region. Target regions, or the place where travelers come from, are defined by Simmons (1991) in four broad areas of the U.S.: Northeast, South, Midwest and West.

The data were analyzed using an average annual growth rate which is defined as the percent change in terms of the size of the market or travel volume. It is derived by taking the current year number (market size or market volume) subtracting the previous year number and dividing by the previous year number; percent change from year to year was then averaged over the study period of 1979 through 1991. Travel market composition is defined as the percent of the market from each area -- such as from each region.

Selected Findings

Overall Market Conditions for 1979 through 1991

The participation rate of all adults selecting New England as a primary destination averaged 3.6% over the decade. An adjusted annual change rate indicated 4.6% decline per year for the U.S. adult market choosing New England as a primary destination. This translates into losing about 140,000 to 150,000 primary destination travelers per year to the region. The peak year during this period was 1984 when 6.9 million destination travelers selected New England as a primary destination. The bottom year was 1991 when 4.2 million destination travelers selected New England. Caution must be noted in the overall results as 1991 was the Gulf War year which had dramatic impacts on the winter related travel during this period of the war. This was particularly harmful for New England as it retains a significant amount of travel based on winter recreational sports (i.e., downhill skiing, cross country skiing, snowmobiling, etc.). (NOTE. For a more complete update of the domestic travel trends for New England by demographic and geographic markets, please see the Warnick, 1993. "The New England Travel Market: Changing Demographics and Geographic Markets, 1980 to 1990." *1993 NERR Proceedings*. pp 205-215.) Those findings may be viewed as somewhat more stable as the Gulf War year was not included within those calculations. The region, as a primary destination, appears to have rebounded in 1992 (these data are not yet fully available, but preliminary reviews indicate the rebound). The overall statistics for this section may be found in Table 2.

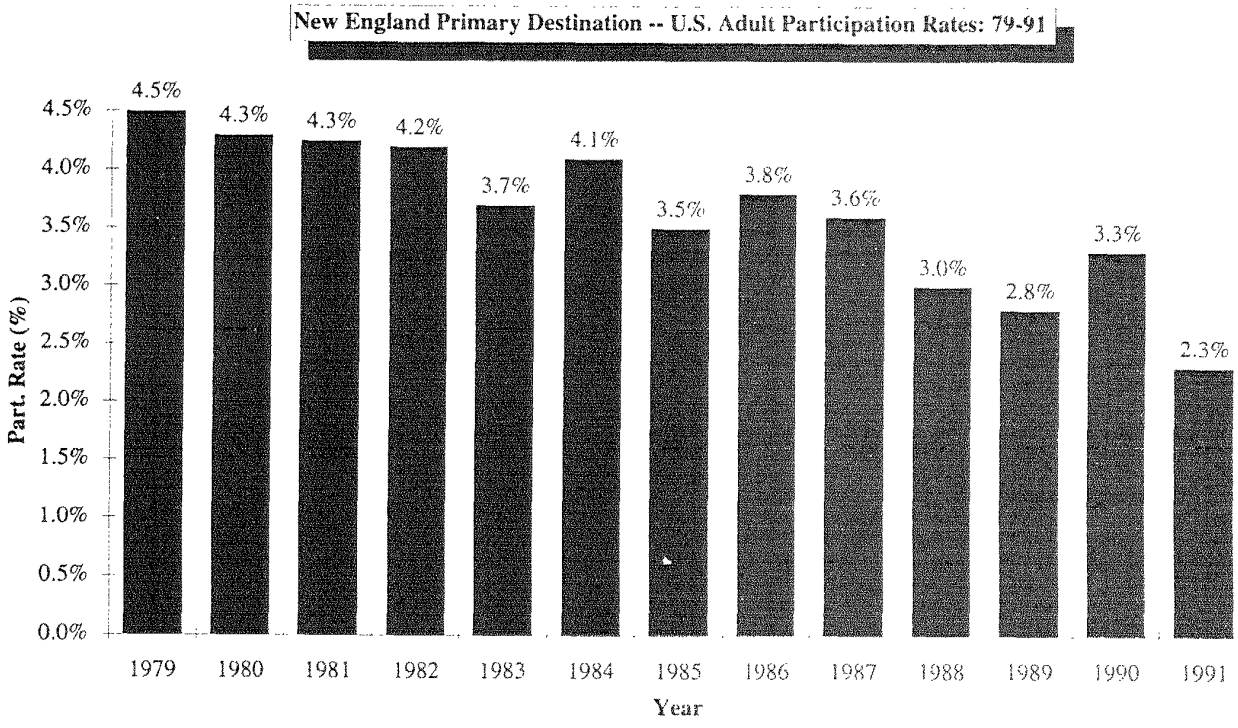


Figure 1. Adult participation rates for New England travel destination, 1979-1992.

Table 2. New England travel market.

New England Primary Destination Choice	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Decade Average	Adj. Annual Change Rate	Two-Point Moving Ave.
Adult Part. Rate	4.5%	4.3%	4.3%	4.2%	3.7%	4.1%	3.5%	3.8%	3.6%	3.0%	2.8%	3.3%	2.3%	3.6%	-4.6%	-3.9%
#New Eng. Trav.('000)	7,062	6,814	6,793	6,772	6,122	6,889	5,960	6,581	6,302	5,324	4,915	5,903	4,232	6,051	-3.3%	-2.7%
Age Cohorts	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Decade Average	Adj. Annual Change Rate	Two-Point Moving Ave.
Adult Overall Rate	4.5%	4.3%	4.3%	4.2%	3.7%	4.1%	3.5%	3.8%	3.6%	3.0%	2.8%	3.3%	2.3%	3.6%	-4.6%	-3.9%
18 to 24	4.6%	3.3%	3.4%	3.4%	3.9%	3.6%	3.0%	2.8%	2.7%	2.5%	1.8%	1.9%	1.6%	2.8%	-7.5%	-6.8%
25 to 34	4.5%	5.8%	4.7%	3.5%	4.5%	4.0%	3.8%	4.4%	4.5%	2.6%	2.7%	3.5%	1.9%	3.8%	-3.3%	-4.7%
35 to 44	5.4%	5.2%	5.4%	5.5%	3.6%	5.3%	4.3%	4.3%	3.6%	3.7%	3.1%	4.5%	2.6%	4.3%	-2.6%	-3.3%
45 to 54	5.2%	5.1%	5.2%	5.3%	4.0%	5.0%	4.0%	3.9%	3.8%	3.9%	2.9%	3.9%	3.0%	4.2%	-2.9%	-3.4%
55 to 64	4.2%	3.5%	3.9%	4.2%	3.4%	4.7%	3.3%	4.6%	3.7%	3.7%	4.0%	2.5%	3.2%	3.7%	0.9%	-2.4%
65 and Older	3.1%	2.3%	3.0%	3.7%	2.4%	2.7%	2.5%	3.0%	3.0%	2.1%	2.3%	2.6%	2.0%	2.6%	-1.0%	-0.7%
Other Age Cohorts	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Decade Average	Adj. Annual Change Rate	Two-Point Moving Ave.
Adult Overall Rate	4.5%	4.3%	4.3%	4.2%	3.7%	4.1%	3.5%	3.8%	3.6%	3.0%	2.8%	3.3%	2.3%	3.6%	-4.6%	-3.9%
18 to 34	4.6%	4.7%	4.1%	3.5%	4.3%	3.6%	3.5%	3.7%	3.8%	2.5%	2.4%	2.9%	1.8%	3.4%	-5.7%	-5.5%
35 to 49	5.6%	5.3%	5.6%	5.9%	3.4%	4.9%	4.1%	4.3%	3.6%	3.8%	3.1%	4.4%	2.9%	4.3%	-2.1%	-3.2%
50 and Older	3.8%	3.2%	3.6%	3.9%	3.3%	4.2%	3.2%	3.7%	3.4%	3.0%	2.9%	2.7%	2.5%	3.3%	-2.4%	-2.5%
Target Region	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Decade Average	Adj. Annual Change Rate	Two-Point Moving Ave.
Northeast	14.5%	14.3%	13.9%	13.4%	11.5%	13.1%	10.8%	11.5%	11.1%	8.8%	6.5%	10.2%	6.4%	11.0%	-4.1%	-4.5%
South	1.7%	1.8%	1.9%	1.9%	1.2%	1.6%	1.4%	1.5%	1.4%	1.3%	1.8%	1.4%	1.1%	1.5%	-1.4%	-2.4%
Midwest	1.6%	1.3%	1.4%	1.5%	1.5%	1.7%	1.8%	2.1%	1.8%	1.7%	1.9%	1.7%	1.4%	1.7%	-0.4%	0.9%
West	1.6%	1.3%	1.3%	1.3%	1.9%	1.2%	1.0%	1.2%	1.5%	1.3%	1.4%	0.9%	1.1%	1.3%	0.0%	-2.2%
Target Region Composition	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Decade Average	Adj. Annual Change Rate	Two-Point Moving Ave.
Northeast	72.4%	72.9%	71.8%	70.7%	68.5%	70.5%	66.7%	65.6%	65.9%	61.5%	50.1%	66.3%	58.1%	65.7%	-1.2%	-1.3%
South	9.6%	10.6%	11.3%	12.0%	8.4%	9.9%	10.1%	9.7%	9.4%	10.7%	15.7%	10.2%	11.2%	10.8%	3.4%	1.3%
Midwest	11.0%	10.3%	11.0%	11.6%	13.6%	14.2%	17.6%	18.9%	16.8%	19.3%	24.2%	17.8%	20.6%	16.3%	6.4%	5.9%
West	7.0%	6.3%	6.0%	5.7%	9.5%	5.3%	5.6%	5.8%	7.9%	8.5%	10.0%	5.8%	9.5%	7.2%	7.9%	2.6%
Total Travel Destinations of Northeast Market ('000)	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Decade Average	Adj. Annual Change Rate	Two-Point Moving Ave.
Total All Known Destinations	138,238	130,431	131,425	132,419	129,781	126,112	119,659	121,750	125,319	122,738	122,913	130,839	130,494	126,990	-0.4%	-0.2%
Northeast	27,646	25,426	23,534	21,642	25,862	28,141	24,064	22,931	24,620	23,877	20,069	21,780	20,870	23,568	-1.8%	-1.7%
New England	5,112	4,965	4,877	4,788	4,335	4,860	3,975	4,318	4,151	3,276	2,460	3,913	2,489	4,034	-3.4%	-3.7%
Mid-Atlantic	7,222	7,135	7,600	8,064	8,205	8,307	7,276	6,268	6,632	6,978	6,094	5,772	4,853	6,932	-2.9%	-2.5%
Other Regions	15,312	13,326	11,058	8,790	13,322	14,974	12,813	12,345	13,837	13,623	11,515	12,095	13,528	12,602	0.6%	-0.2%
NE Share of All	3.7%	3.8%	3.7%	3.6%	3.3%	3.9%	3.3%	3.5%	3.3%	2.7%	2.0%	3.0%	1.9%	3.2%	-3.3%	-3.5%
NE Share of NoEa	18.5%	19.5%	20.7%	22.1%	16.8%	17.3%	16.5%	18.8%	16.9%	13.7%	12.3%	18.0%	11.9%	17.0%	-1.7%	-1.7%
Mid-Atl Share of NoEa	26.1%	28.1%	32.3%	37.3%	31.7%	29.5%	30.2%	27.3%	26.9%	29.2%	30.4%	26.5%	23.3%	29.4%	-0.4%	-0.4%

Source: Simmons Market Research Bureau. 1979 to 1991. Study of Media and Markets. Vol. P-4, Travel. New York. New York.

NOTE: Use summary statistics (average, annual change rate, moving average) with caution; distorted by 1991 data (The Gulf War Year).

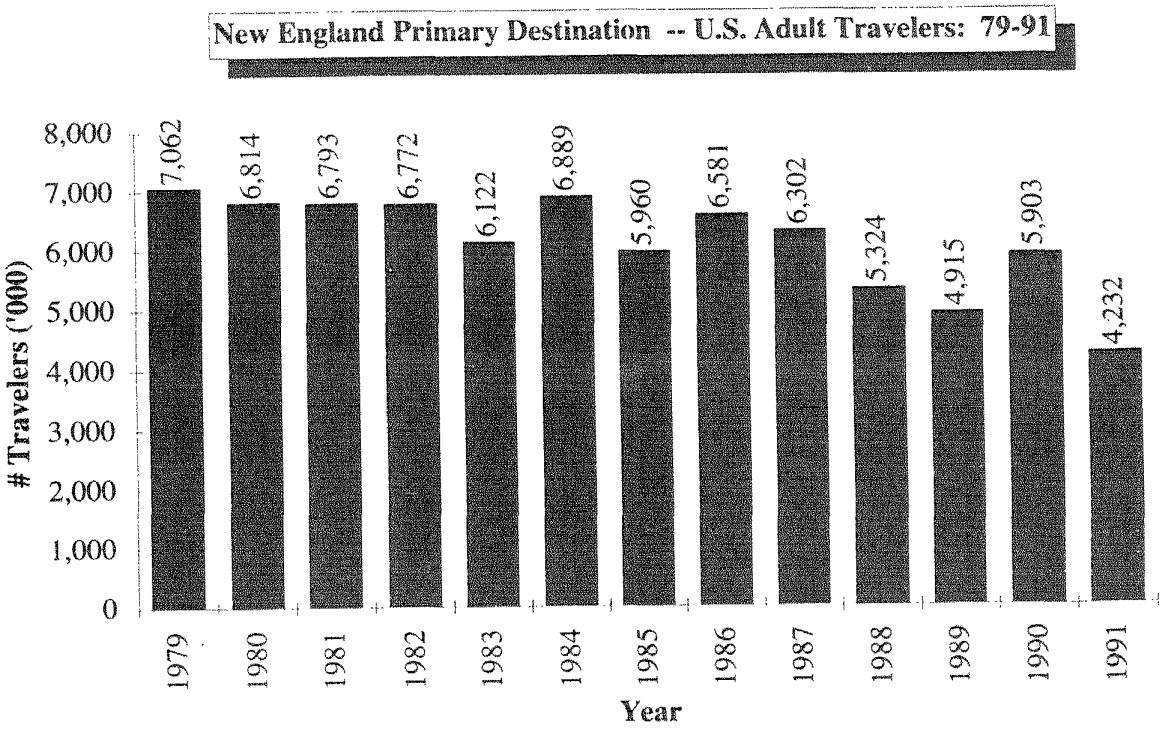


Figure 2. New England destination travelers, 1979-1991.

New England's Demographic Markets
Are the travelers to New England young or old and are there are prevalent trends noted here? These findings update the author's 1993 study be adding data from 1979 and 1991. New England declined as a destination choice for five of the six age cohorts:

- 18 to 24 year olds -- declined by 7.5%
- 25 to 34 year olds -- declined by 3.3%
- 35 to 44 year olds -- declined by 2.6%
- 45 to 54 year olds -- declined by 2.9%
- 65 and older -- declined by 1.0%

However, New England grew as a destination choice for one of the six age cohorts:

- 55 to 64 year olds -- increased by ".9"%

These data suggest that the New England destination market has continued to decline. There is some indication that age cohorts changes are more drastic and provides some speculation as to whether specific generations have indeed contributed to the overall decline in travel participation.

New England's Generational Market Trends
A different view of travel to New England may be gained when generations are examined over time. Is the market changing? Is New England's base market becoming older, is the region still attracting their fair share of younger adults?

There appear to be watershed years evident in these data even though there has been an overall decline in domestic travel to New England in the years examined here. Participation rates for five of the six age cohorts ticked up after 1989. This happens to be the very point when each generation is neatly confined within the corresponding 10 year age segments. For example, in 1989 all of the Baby Boomers had moved up one age cohort from "18 to 24" to "25 to 34" and "25 to 34" to "35 to 44." This change, which appears to indicate a change in the overall decline trend could then be called a "watershed year" -- a point in time when the overall pattern changes. Even within these overall changes, there may be age specific changes which may provide more insights into the changes in travel patterns to New England. See Figure 3 (next page) for changes in travel pattern participation trends by age cohorts.

The overall rate of decline appears much more pronounced in age categories under 35; the rates of decline were more than double of their older counterparts (see "Other Age Cohort" configurations in Table 2 here). Specifically, rates declined at a rate of nearly 7% per year for 18 to 24 year olds and over 3% for 25 to 34 year olds. Rates of age groups over 35 also declined, but they declined at a slower rate of approximately 3% percent per year or less. The age category where domestic travel declined the least was the 55 to 64 and older category. However, the overall problem still remains. One is looking at static age cohorts; but, we need to look at generations as they move through time.

Some findings affecting the data provide insights into how the data are affected by the aging population and the movement of generations through particular age cohorts. For example, a look at the younger generations provides some insights into how people change their travel behavior over time. In 1979, Baby Boomers were 35 or under. By 1989, a watershed year, Baby Boomers were in the 25 - 34 and 35 - 44 year old categories. Within the 18 to 24-year-old category, for example, domestic travel

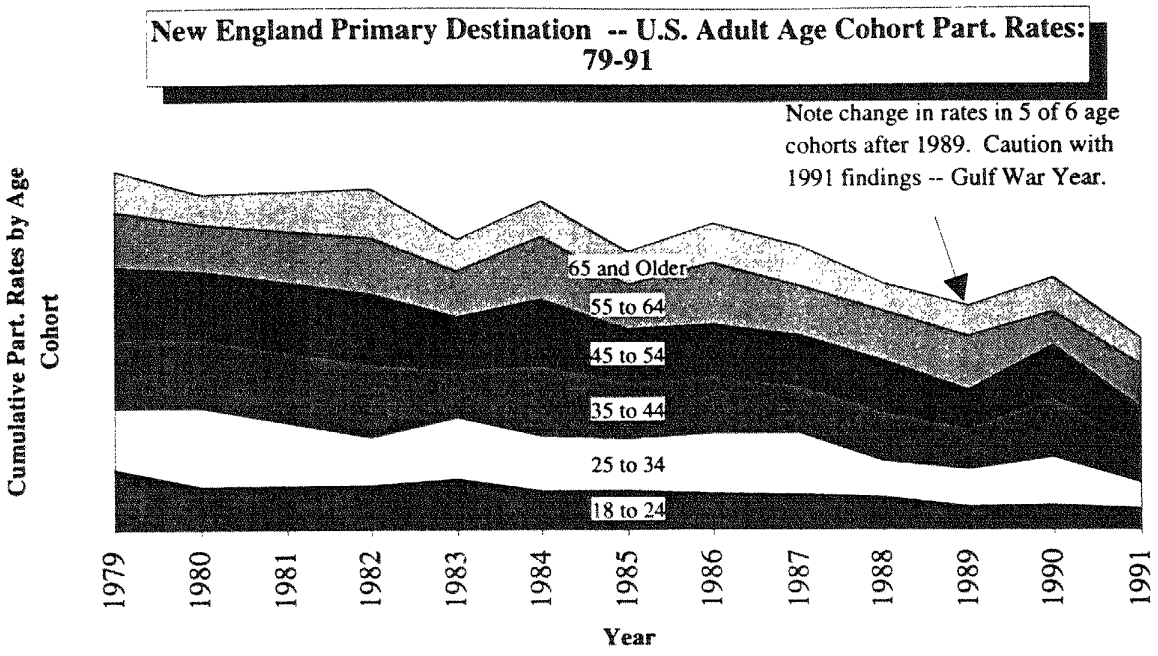


Figure 3. New England primary destination, U.S. adult participation rates by age cohort, 1979-1991.

participation rates declined steadily from '79 through '91. From '89 to '91, rates increased by 5% for 18 -24 year olds at the national level, but, there has been no corresponding change in participation rates among these young adults traveling to New England. The "Baby Bust" or "13th Generation" fully comprised the 18 - 24 year old cohort after the year 1989.

The "Silent Generation" adults were largely in the 35 to 54 age categories from 1979 through 1989; then moved ahead into 45 to 64 year old groups. Their domestic travel behavior participation rate declined from 1979 - 1989 in the 35 to 44 age category. In 1979, the New England travel participation rate was 5.4% and it declined to 3.1% in 1989. It appears to have rebounded in 1990 at 4.5%. The older half of the "Silent Generation," age 45 to 54, experienced a decline in New England travel participation from 5.2% in 1979 to a low of 2.9% in 1989. It, too, has appeared to have rebounded to 3.9% in 1990. However, this was the only age cohort to experience an increase in participation rates for New England.

Next, the "G.I. Generation" held the most stable New England travel participation rate over the decade when they were age 55 to 64. Their participation rates in 1979 was 4.2% and dropped to its lowest rate of 2.5% in 1990, but generally held between 3.3% and 4.7%. The "G.I. Generation" moved out of the 55 to 64 age group and completely into the 65 and older age category by 1989. The upward trend in growing domestic travel in this age category was largely fueled by the "G.I. Generation" moving into retirement years.

The year 1989 was a watershed year. This is a positive note for the domestic travel industry in New England. Participation rates appear to have rebounded after the 1989 year; however the Gulf War in 1991 has clouded the picture. Caution must be observed because participation rates only indicate what percent the overall population and individual members of age categories participate and not how frequently they travel. New England's dominant demographic market are the 35 to 50 year olds, who have the highest participation rates and specifically the Baby Boomers (age 35 to 44).

The Transition of Generational Participation Rates in Domestic Travel

In this portion of the study, generations were examined during the transition from one decade to the next. The overall participation change by generation from one decade to the next was examined within the context of three periods(1979 to 1989; 1980 to 1990 and 1981 to 1991). National domestic travel participation of declined on average of 9% for these three year groupings (Warnick 1993A); however, travel to New England overall, was only off 1.6% on average over these three time periods.

The Baby Boom Generation's participation rate in New England destination travel declined at the same or a lower rate. This is a positive sign. The younger half of the Baby Boom Generation (those age 25 to 34 in the 90s), had participation rates which declined less than any other age cohort. This segment of the Baby Boom Generation has a participation rate which decline -1.1% on average for these three periods. In fact, from 1980 to 1990, their travel participation behavior actually increased slightly. The older half of the Baby Boom Generation, those age 35 to 44 in the 90s, had a decrease in participation rates as they aged, but it was not higher than the overall population participation rate change for the same period. The "Silent Generation" which appears to be a

growth market nationally is not as strong in its travel intentions to New England. The younger half of this generation, those age 45 to 54 in the 90s, had the highest decline in New England destination based travel of all of the generations. Because the GI Generation has entered into the 65 and older cohort, not as much can be read into the changes in the their travel patterns. However their participation rate change was equal to the overall populatio change for the region and is much lower than the change at the national level. See Tables 3 and 4 for changes in participation rates by generations over the decades.

Table 3. Generational changes in New England domestic travel participation rates: 1979, 1980 to 1990 and 1981 to 1991.

Generation, Age Category and Year	1979	1989	Change	1980	1990	Change	1981	1991	Change	Average Decad Change Rate
Baby Boom Generation										
18 to 24 year olds (79,80,81)	4.6%			3.3%			3.4%			
I->25 to 34 year olds (89,90,91)		2.7%	-1.9%		3.5%	0.2%		1.9%	-1.5%	-1.1%
25 to 34 year olds (79,80,81)	4.5%			5.8%			4.7%			
I->35 to 44 year olds (89,90,91)		3.1%	-1.4%		4.5%	-1.3%		2.6%	-2.1%	-1.6%
Silent Generation										
35 to 44 year olds (79,80,81)	5.4%			5.2%			5.4%			
I->45 to 54 year olds (89,90,91)		2.9%	-2.5%		3.9%	-1.3%		3.0%	-2.4%	-2.1%
45 to 54 year olds (79,80,81)	5.2%			5.1%			5.2%			
I->55 to 64 year olds (89,90,91)		4.0%	-1.2%		2.5%	-2.6%		3.2%	-2.0%	-1.9%
G.I. Generation *										
55 to 64 year olds (79,80,81)	4.2%			3.5%			3.9%			
I->65 and over (89,90,91)		2.3%	-1.9%		2.6%	-0.9%		2.0%	-1.9%	-1.6%
Overall Population Travel Rate										
Early Rate	4.5%			4.3%			4.3%			
I-> One Decade Later Rate		2.8%	-1.7%		3.3%	-1.0%		2.3%	-2.0%	-1.6%

* The generation change of the GI Generation is report for consistency only; this generation's domestic travel participation rates are confounded by the presence of two other older generations (those 85+).
Source: Simmons Market Research Bureau. 1979-1991. Study of Media and Markets, Vol. P-4. Travel.

Table 4. Generational diagonal in domestic travel behavior in New England.

	The Early 80s			The Early 90s		
Year------>>>	1979	1980	1981	1989	1990	1991
Life Stage and Age Cohort						
Elder						
65 and Older	Lost/GI	Lost/GI	Lost/GI	GI	GI	GI
Travel Part. Rate	3.1%	2.3%	3.0%	2.3%	2.6%	2.0%
Midlife						
55 to 64	GI	GI	GI	Silent	Silent	Silent
Travel Part. Rate	4.2%	3.5%	3.9%	4.0%	2.5%	3.2%
45 to 54	Silent	Silent	Silent	Silent	Silent	Silent
Travel Part. Rate	5.2%	5.2%	5.2%	2.9%	3.9%	3.0%
Rising Adult						
35 to 44	Silent	Silent	Silent	Boom	Boom	Boom
Travel Part. Rate	5.4%	5.2%	5.4%	3.1%	4.5%	2.6%
25 to 34	Boom	Boom	Boom	Boom	Boom	Boom
Travel Part. Rate	4.5%	5.8%	4.7%	2.7%	3.5%	1.9%
Youth						
18 to 24	Boom	Boom	Boom	Thirteenth	Thirteenth	Thirteenth
Travel Part. Rate	4.6%	3.3%	3.4%	1.8%	1.9%	1.6%

Source: Simmons Market Research Bureau. (1979, 1980, 1981 and 1989, 1990, 1991). Study of Media and Markets, Vol. P-4, Travel.
Strauss and Howe. 1991. History of America's Future, 1584 to 2069. New York, NY: William Morrow.

Conclusions and Implications for Recreation and Tourism Resource Managers

Trends were evident in the New England Travel Destination Market from 1979 through 1991. New England has become even more mature as destination market over the last decade since the last year's review (Warnick 1993B). The travel market is not in a high growth mode and the findings hear appear to be affected by the Gulf War of 1991. The actual adult participation rate has declined and the actual number of travelers is down slightly. Although New England is without a doubt one of the United States' most definable or marketable travel destination regions, the decline can be partially attributed to changing demographics and travel preferences of different generations.

However, this review of travel by different generations indicates some new insights and raises even more questions.

- Why is New England not gaining in popularity with the current young adults (those 18 to 24 years old)?
- Why is the Silent Generation not a growth market for New England as it is at the national level?
- The Baby Boomers appear to still be a potentially strong future market. Will they come?
- Can these data be used in predicting the future of travel to New England?

Trend analysis on an on-going basis is necessary. An analysis of these data for the period 1979 through 1991 indicated continued concern over an overall declining market for domestic travel in New England. However, the Gulf War and its impact on the 1991 data provides little comfort that the travel market has not yet fully rebounded. The addition of two more years of data indicated that the overall market declined up to 1989, then recovered in 1990 and then declined again in 1991. Was this a reflection of real market conditions or a spike in the data for 1990? Probably, it is a combination of both conditions. Furthermore, an examination of only year to year change can be misleading. For example, the Gulf War did influence travel to most all regions in the U.S. in 1991 and it appears to also had substantial impacts on the New England Region. The changes must be viewed in an overall pattern change.

Market change over time is another important travel trend issue which was examined here. People who participate in travel pursuits may change their rates of travel based on their individual household conditions. It is very possible that people who travel frequently one year might not travel as frequently the following year. Travel related behavior, like recreational related behavior, may reveal changing patterns over the life span or through age cohorts or even changes in attitudes about travel as one ages.

This study revealed further changes in the overall market traveling to New England. First, New England appears to be falling out of favor with young adults. This was must evident in the 18 to 24 year old segment where the rates declined by over 7% per year. This decline was even more dramatic than the 1993 findings indicated (Warnick 1993B). The 25 to 34 year market also declined in participation of traveling to New England by over 3% per year. Both the 35 to 44 and 45 to 54 year old markets declined by nearly 3% per year. The 55 to 64 year old segments increased only slightly and the 65 and over segment declined by about 1%. Finally, another view of the data revealed that the dominant age group for travel to New England are 35 to 44 year olds. This age cohort is comprised largely of Baby Boomers in the 90s.

These trends, if they continue may mean some very basic changes in how travelers use the resources in New England. If we assume that the region is losing the more active travelers (younger age cohorts usually have higher participation rates in active recreational pursuits than older cohorts); then activities which are likely to grow may include hiking, walking, visiting historic places and more passive forms of recreation and entertainment. Activity resource areas which are likely to see declines in participation may include swimming, skiing, and outdoor resource based activities -- such as hunting, snowmobiling, water skiing, for example. These fundamental uses may not be dramatic changes, but will gradually change. Furthermore, unlike the national market where the Silent Generation, those 45 to 64, is seen as a strong growth travel market in the years ahead, this market is not growing in its choices of New England as a destination. At the national level, the younger half or the Silent Generation is the dominant market; however, this generation's travel participation behavior has declined the most in New England. Even though New England is losing its share of younger travelers, it does appear to be particularly at least stable for the older half of the Silent Generation -- those 55 to 64 years old. The Baby Boom Generation appears to be one of the potential growth markets for New England for the next decade.

New England is not the "hot market" it was a decade ago for domestic travel. Other regions appear to have marketed their regions more aggressively and successfully. More of the Northeast travel market, New England's primary source of travelers, have revealed more travel tendencies to other parts of the United States over the decade (Warnick 1993B). The aggressive nature of other regions, the revitalization of market areas, and the overall changing demographic and generational travel pattern changes may explain the repositioning of the New England Region. Furthermore, it may be that New England is now one of many choices and is losing market share based on a growing diversification in the travel market. Furthermore, business travel has slowed with the downturn in the New England industrial and manufacturing economy.

What are the choices for the tourism and travel industry and businesses within the New England? First, it must be noted that there is not high growth in the domestic travel market as defined within the context of this study. It continues to be a mature and declining market. It may be out hustled and repositioned by other more aggressive and perhaps potentially more attractive destination choices. Long term, there are signs that market conditions may improve. More retirees and an aging population with more free time should help to increase domestic travel demand to this region. Short term, the growing family market is particularly promising. New England is positioned near areas with large numbers of Baby Boomers with children. Agencies' positioning statements and plans and market place promotions should consider the family market. It is a viable market and will be aggressive pursued over the next decade. The rate of decline was smallest for the younger half of the Baby Boomer market which is just entering its rising adulthood years with children entering the nest. The market is likely to be strong for the next decade. The aging population and the increase of older markets is particularly promising for the New England. While the Silent Generation does not look as strong for New England as the trend does at the national level, the GI market may provide some promise for the very short term. This market declined the least after the Baby Boom Generation. New England's noteworthy historical, education and medical centers all may combine to attract more of these travelers to the region.

The longer stay behavior patterns of the family and older age markets does traditionally match well with the typical New England vacation. Those agencies which depend on a younger market (i.e., young adults 18 to 30 for example) must carefully review the future market potential and understand that this market's behavior is different than that of the older adults. This group of young adults belongs to the "Thirteenth or X Generation" and it is very different in its travel behavior than was the older Baby Boom Generation. The personality type of this generation is evolving from one of alienation into pragmatism. While they like to travel, destination choices must offer high quality and exciting experiences at relatively low cost. This group will become pragmatic much more quickly than their older counterparts, the "idealistic" Baby Boomers. Value is key to the X Generation due to income constraints. It is likely that this

market will be one of shorter stays, but perhaps more frequent trips. They view recreation, leisure and travel as a right, not a privilege. The message to them should reflect their culture of being blunt, flashy, kinetic, "MTVish", pragmatic and survivalistic (Warnick 1993A and Strauss and Howe 1991). One may learn how responsive this market is by watching the clues of how the market is targeted in the advertising world over the next decade.

With no strong growth patterns in the domestic market, recreation and tourism businesses must seek to balance market demand through either new markets or return markets. Furthermore, businesses must recognize that travel just does not "happen" anymore. Today's travelers have a diverse menu of national and international travel destinations to chose from during their free time. Heavily discounted airfares may prompt some travelers to go to more distant locales. Baby Boomers are a market who change their loyalties quickly. A decade ago they were called "Yuppies" and were buying big ticket items (BMWs, condos on the beach, wine coolers, etc.). They indulge in the fast lane of life. Today, this same generation is moving into family life, trying to juggle the same pace for life, but beginning to slow down. The items which they purchase may still be expensive, but they are indeed different (mini-vans; Legos™; fruit juices, etc.). They are rapidly moving to healthier lifestyles. They have realigned their life perspectives and are "downshifting" in order to simplified their hectic schedules. These cultural, generational and lifestyle changes will impact on their vacation desires, too. Once fast paced, exciting vacations were the draw for them. Today, stress reduction, healthy-orientation, and family experiences may be the draw. Time changes markets and markets change in their desires.

Tourism and recreation businesses can no longer expect to benefit from growth markets where a new customer base is constantly replaced with another customer base. Mature market conditions spur customer retention strategies and market share competitiveness. In other words, these businesses must work hard to retain their current patrons because other firms will be seeking to draw them away. It simply will be a more competitive tourism marketplace in New England in the 90s.

This review of domestic travel within the generational context of travelers to the New England destination area provides new insights and how the market conditions for the 1990s may be evolving. National trends can be misleading within a regional context. The changes in the national travel market were not duplicated in the New England travel market. However, closer and more intense monitoring of travel trends, both domestic and localized, is still needed. Much is still not known about the inner travel patterns within New England or about the travel volume of each of these segments examined here. But, travel patterns have evolved and the New England travel market is much different than it was just one decade ago.

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Interpretation, Education and Outreach



THE EFFECT OF A VERBAL INTERPRETIVE MESSAGE ON DAY USER IMPACTS AT MOUNT RAINIER NATIONAL PARK

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The behaviors of 434 hikers visiting the heavily used Bench Lake/Snow Lake Trail at Mount Rainier National Park were observed to assess the effect of a verbal interpretive message on compliance with minimum impact hiking recommendations. Significant relationships were found between compliance and message exposure, and a variety of situational and demographic variables.

Introduction

Off-trail hiking at Mount Rainier National Park is of increasing concern. Many of the trails accessible to the day use visitor are located within fragile subalpine meadows. Off-trail hiking within these areas creates a variety of undesirable impacts including trampled vegetation, bare ground areas, soil erosion, and a network of unsightly social trails. Encouraging minimum impact hiking is important not only for minimizing impacts on the resource, but also for enhancing the park visitors' experience. The effects of the quality of the natural environment on visitor experiences have been well documented (Brown, Richards, Daniel and King 1990; Daniel, Brown, King, Richards and Stewart 1989; Vaske, Graefe, and Dempster 1982).

Mount Rainier's day user service area includes the growing communities of Seattle and Tacoma, Washington, which are within a two to three hour drive of Mount Rainier. Day use visitation from these areas is projected to increase as the population within the Puget Sound area of Washington state continues to grow. From 1980 to 1990 the three county area, Pierce, King, and Snohomish, on the eastern shore of the Puget Sound, experienced a 22.3% population increase to 2.5 million people, rising by 465,879 (U.S. Department of Commerce 1980; 1990). It has been documented that most of the off-trail hikers in the Paradise area of the park were in-state residents, thus exacerbating this management problem (Johnson and Swearingen 1988).

Because of the high levels of use and fragile habitats, the park's wilderness management plan includes regulations which prohibit off-trail hiking in the Sunrise and Paradise day use areas. Although it is not illegal, off-trail hiking is discouraged in the fragile meadows outside of these restricted areas. The existing park management policies are based on those methods that are the most effective in deterring off-trail hiking, yet least offensive to the visitor (Samora 1991).

The intent of this study was to investigate possible management strategies to discourage off-trail hiking. Specifically the indirect management approach of presenting a verbal interpretive message was tested for its effectiveness on increasing hiker compliance with minimum impact hiking recommendations.

Previous studies suggest that attitudes and behaviors of hikers at Mount Rainier were most influenced by interpretive messages emphasizing that the visitor's behavior has a direct impact on the vegetation (Johnson and Swearingen 1988). Anderson and Manfredo (1985) suggest that land managers need to communicate clearly to visitors the reasons for a proposed action. Mercer (1984) recommends that education and information programs include not only minimum impact skills and techniques to avoid impacts, but also information about wilderness philosophies, values, history and policy, management techniques, and information about the ecosystem itself. Further, interpretive programs must be designed to reach people at all six levels of Kohlberg's moral development (Christensen and Dustin 1989). Messages should be designed to create some conflict or dissonance to encourage people to advance to the next stage of moral reasoning. The recommendations provided by these previous studies were incorporated into the message design tested during this study. Stage one of Kohlberg's moral development was eliminated from the message, since no formal sanction for off-trail hiking is enforced in the study area.

Methods

Subjects

The subjects involved in this experiment were day visitors to the Bench Lake/Snow Lake Trail at Mount Rainier National Park, Ashford, Washington. The Bench Lake/Snow Lake Trail receives intense use during the summer months. Between 90 and 120 visitors hike the trail on an average summer weekend day. The trail is 1.3 miles long and of moderate difficulty. It leads to one of the most scenic areas of the park. Subjects included day hikers on Fridays through Mondays during the second half of July, and the entire month of August, 1992.

Data Collection

Hiking parties approaching the trailhead were systematically assigned to the experimental or control group. On-site personal interviews were conducted at the trailhead prior to hike initiation. While subjects were completing the survey, the interviewer recorded the assigned group and individual numbers of the hikers, hiker descriptions, time of the interview, and experimental or control group status.

Following the interview, the interviewer, wearing a Student Conservation Association uniform, informally delivered the verbal interpretive message to hiking parties assigned to the experimental group. The opportunity for conversational interaction (comments and questions) between the hikers and interviewer existed. The message was as follows:

"On your hike today, please stay on designated trails. If you go to the lakeshores or beyond the waterfall, be sure to walk on the rocks, because the meadows and forests you are about to enter are unique and fragile. They are easily damaged by trampling. As few as 15 people walking off the trail in the same location can cause noticeable damage to the soils and vegetation. Revegetation efforts funded by tax dollars are only successful if people stay on the trails. If you enjoy the area from the trails, future generations will be able to enjoy its beauty as well."

Following the interview and message delivery, the interviewer communicated the assigned group number, the individual subject numbers, and hiker descriptions to the observers via a hand radio transceiver. This was done once the hikers were on the trail and out of sight and hearing range. Once the hikers approached the lake, hidden observers, dressed in casual clothing, observed and recorded the behaviors of the hikers and whether the hikers complied with the message. The observers utilized binoculars to observe the hikers at a distance whenever possible, in order to be unobtrusive. Hikers were observed for thirty minutes or until the hiking party was out of site, whichever occurred first.

Pilot Study
A pilot study of the procedures was conducted during the first two weekends of July, 1992. The boundaries of the study area and the length of the observation time were determined during the pilot study. Also, inter-rater reliability was established for the two observers employed in this study. The two observers independently recorded observations on 13 hiking parties to ascertain the consistency of their ratings. The observers came to the same conclusion regarding compliance levels ninety-two percent (92%) of the time. Thus, their findings were judged to be comparable and were used for further statistical calculations.

In addition, a manipulation check was performed to confirm that the experimental group and control groups perceived a difference in their treatments. This step was important in ascertaining the effectiveness of the verbal interpretive message. As subjects returned from their hikes, they were asked whether they had received a message on minimizing hiking impacts prior to their hike. The subjects' answers were recorded on the master sheet next to their previously logged information. For the twenty-three cases checked, the participants' perceptions were in complete (100%) agreement with their assigned treatment groups; experimental groups members perceived receiving a message, control group members had not. The manipulation check therefore confirmed the use of control and experimental groups.

Independent Variables
The independent variable pertaining to the main research question was exposure to a verbal interpretive message on minimum impact hiking techniques. Other independent variables measured during the interview were age, gender, education level, ethnicity, location of the subject's permanent residence, occupation, group make-up, hiking experience of the individual, membership in environmental organizations, visitation at visitor information centers, and exposure to park educational information sources. Other independent variables recorded through observations were the size of the hiking party, the number of other people present at the study area excluding other party members, and the number of non-compliant hikers present excluding other party members.

Membership in environmental organizations was used as an indicator of environmental concern. This measure was part of a reliable and valid environmental concern instrument developed by Schahn and Holzer (1990). Environmental action such as conservation organization membership is a stronger measure of environmental concern than positive environmental attitudes or verbal commitment to the environment (Van Liere and Dunlap 1981). Higher correlations existed between independent variables and responsible environmental behavior when the subjects had ties to an environmental organization (Hines 1984).

Dependent Variables
Level of compliance with the recommendation to stay on the trail or walk on rocks while off-trail was the dependent variable measured through observations of hiker behavior. Visitors were considered to be compliant with the minimum impact hiking recommendations if they stayed on the trails, or walked on rocks to avoid vegetation while traveling off-trail. Visitors were considered to be non-compliant if they intentionally stepped off the trail for a short distance to stand, sit or photograph; walked off-trail for longer distances or durations without walking on rocks; or created environmental impacts in addition to off-trail hiking such as littering, harassing wildlife, washing in the lake, picking flowers, cutting or carving vegetation, building a campfire, and disturbing or removing natural features.

Results

Description of the Sample
Eight hundred eighty-four individuals were included in this study. Four hundred nine were exposed to the verbal message, four hundred seventy-five were not exposed to the message, and four hundred thirty-four of these individuals were observed. Overall, the majority of hikers (54%) were non-compliant with the verbal message.

The average Bench Lake/Snow Lake Trail hiker ...

- was Caucasian
- was a college graduate
- was employed in a managerial or professional occupation
- resided in the Seattle-Tacoma area of Washington
- was aged thirty-one to forty years
- hiked in a family group of three to five persons
- had no children in their hiking party
- started their hike during mid-day between 11 a.m. and 1 p.m.
- hiked one to five times during the previous year including trips to Mount Rainier
- was not a member of an environmental organization
- sought an easy trail with scenic beauty
- sought participation in wildflower viewing, photography, and wildlife viewing
- hiked for two to three hours.

Relationships between Independent Variables and Compliance
Exposure to message. Based on the results of a chi-square analysis, a significant relationship was found between exposure to a verbal interpretive appeal for minimum impact hiking and compliance [C^2 (1,4) = 44.87, p = .00000]. The majority of the individuals who did not receive the message (64%) were non-compliers, compared to forty-two percent (42%) of the individuals who did receive the message. The majority of message recipients (58%) were compliant.

Age. Based on the results of a chi-square analysis, a significant relationship was found between age group and compliance [C^2 (4,4) = 47.99, p = .0001]. The majority of hikers aged sixteen to twenty (69%), thirty-one to forty (53%), and forty-one to sixty-five (67%) were compliant with the minimum impact hiking recommendations. Ironically, all of the hikers who created environmental impacts in addition to hiking (e.g, harassing wildlife, littering) were aged sixteen to twenty. The majority of hikers aged twenty-one to thirty (57%) and over sixty-five (67%) were non-compliant.

Level of education. Based on the results of a chi-square analysis, no significant relationship was found between level of education and compliance [C^2 (6,4) = 17.50, p = .6803].

Gender. Based on the results of a chi-square analysis, no significant relationship was found between gender and compliance [C^2 (1,4) = 4.741, p = .31492].

Ethnicity. Based on the results of a chi-square analysis, a significant relationship was found between ethnicity and compliance [C^2 (5,4) = 114.45, p = .00000]. The majority of African Americans/Blacks (73%) were compliant. The majority of Asian Americans/Orientals (78%) were non-compliant. Caucasians/Whites and "other" ethnic groups were equally split between compliers and non-compliers. Only one Hispanic and no Native Americans were observed.

Location of residence. Based on the results of a chi-square analysis, a significant relationship was found between location of residence and compliance [C^2 (61,4) = 267.61, p = .00001]. The majority of hikers residing within King and Pierce Counties of Washington State (Seattle-Tacoma area) (59%) were non-compliers. The majority of hikers residing in other counties within Washington State (52%), residing out of state (60%), and in foreign countries (56%) were compliant with the minimum impact hiking recommendations. Only King and Pierce County residents were observed creating environmental impacts in addition to those from off-trail hiking.

Occupation. Based on the results of a chi-square analysis, no significant relationship was found between occupation and compliance [C^2 (9,4) = 28.412, p = .3899].

Group make-up. Based on the results of a chi-square analysis, a significant relationship was found between group make-up and compliance [C^2 (7,4) = 106.465, p = .00000]. The majority of hiking parties comprised of individuals (76%), and family groups (56%) were compliant. These family groups did not necessarily contain children. Many were married couples and other combinations of adults. The majority of groups comprised of family and friends (51%), friends (53%), and organized group tours (94%) were non-compliant. Specifically, organized group tours comprised of church groups (100%) and foreign travelers (100%) were non-compliers, while an organized group tour comprised of a hiking club (100%) complied.

Hiking party size. Based on the results of a one-way analysis of variance, a significant difference was found between compliers and non-compliers with regard to hiking party size [F = 4.27, p = .002]. Specifically, there were larger party sizes ($\bar{x}$ = 4.10) with those who traveled off-trail without walking on rocks, compared to the party sizes ($\bar{x}$ = 3.58) with those who either stayed on the trail or walked on rocks while off-trail. As hiking party size increased, compliance decreased.

Number of other people present. Based on the results of a one-way analysis of variance, a significant difference was found between compliers and non-compliers with regard to the number of others present (excluding other party members) [F = 5.66, p = .000]. Specifically, there was a greater number of others present ($\bar{x}$ = 1.34) with those who traveled off-trail without walking on rocks, compared to the number of others present ($\bar{x}$ =.60) with those who stayed on the trail. As the number of other people present at the site increased, compliance decreased. Individuals who created environmental impacts in addition to off-trail hiking were the exception. The few individuals observed throwing rocks at wildlife had no other people present.

Number of non-compliant hikers present. Based on the results of a one-way analysis of variance, a significant difference was found between compliers and non-compliers with regard to the number of non-compliant hikers [F = 4.30, p = .002]. Specifically, there were more non-compliant hikers present ($\bar{x}$ = .68) with those who traveled off-trail without walking on rocks, than with those ($\bar{x}$ = .18) who stayed on the trail. As the number of non-compliant hikers present at the site increased, compliance decreased. Individuals who created environmental impacts in addition to off-trail hiking were the exception. The few individuals observed throwing rocks at wildlife had no other people present.

Level of hiking experience. Based on the results of a one-way analysis of variance, no significant difference was found between compliers and non-compliers with regard to the level of hiking experience at Mount Rainier [F = .27, p = .847].

Degree of environmental concern. Degree of environmental concern was measured as the number of memberships in environmental organizations. Based on the results of a chi-square analysis, no significant relationship was found between the degree of environmental concern and compliance [C^2 (5,4) = 26.304, p = .1560].

Visitor center visitation. Based on the results of a chi-square analysis, a significant relationship was found between visitation at visitor information centers and compliance [C^2 (1,4) = 17.623, p = .0015]. The majority of both visitor center visitors (53%) and non-visitors (58%) were non-compliant. Further analyses show that visitation at some visitor centers exhibited a significant relationship with compliance, while others did not. Visitation at the Longmire Museum and the Paradise Visitor Center was related to minimum impact compliance. The relationship between visitation at the Longmire Hiker Information Center and compliance approaches statistical significance. Significant relationships were not found between visitation at other visitor information centers and compliance. It is uncertain what factors associated with these visitor information centers influenced compliance. Visitor center visitors could have been exposed to a ranger, indoor exhibits, or a variety of other interpretive media.

Park educational information sources. Based on the results of a chi-square analysis, no significant relationship was found between overall exposure to educational information sources prior to the hike and compliance [C^2 (1,4) = 2.3116, p = .5103]. Through further analyses, it was apparent that some educational information sources influenced level of compliance, while others did not.

There was a significant relationship between exposure to naturalist's walks/talks and compliance [C^2 (1,4) = 15.3905, p = .0015]. The majority of individuals who were exposed to a naturalist's walk or talk (70%) were compliant with the minimum impact hiking recommendations. The majority of hikers who were not exposed to naturalist's programs (52%) were non-compliant. Naturalist's walks/talks were the most powerful educational information source in influencing compliance in this study.

Based on the results of a chi-square analysis, a significant relationship was found between exposure to indoor exhibits and compliance [C^2 (1,4) = 7.7248 p = .0521]. The majority of individuals who were exposed to indoor exhibits (59%) were compliant with the minimum impact hiking recommendations. The majority of individuals who were not exposed to indoor exhibits (54%) were non-compliant.

There was a significant relationship between exposure to personal contact with a park ranger and compliance [C^2 (1,4) = 8.3912, p = .0386]. The majority of individuals who were exposed to personal contact with a park ranger (60%) were compliant with the minimum impact hiking recommendations. The majority of individuals who were not exposed to contact with a ranger (53%) were non-compliant.

Presence of children. Based on the results of a chi-square analysis, a significant relationship was found between the presence of children in the hiking party and compliance [C^2 (1,4) = 27.0396, p = .00002]. The majority of both individuals hiking with children (59%) and without children (51%) were non-compliant. Fewer individuals with children complied by walking on rocks while off-trail, compared to individuals without children. Further, there was a significant relationship between the ages of the children in the hiking party and compliance [C^2 (1,4) = 12.9952, p = .04311]. Although the majority of hiking parties with children of any age were non-compliant, a larger proportion of individuals with children aged five to then (72%) were non-compliant than those with children aged eleven to fifteen (60%) or under five (56%).

In summary, individuals who complied with the minimum impact hiking recommendations can be described as follows. The majority of the following groups *complied* (all relationships shown were statistically significant):

❀ message recipients		(58%)
❀ persons aged	16 - 20	(69%)
	31 - 40	(60%)
	41 - 65	(60%)
❀ African Americans	(73%)	
❀ residents of	Washington State (excluding King and Pierce Counties)	(52%)
	other states	(60%)
	foreign countries	(56%)
❀ those hiking	alone	(76%)
	with family	(56%)
❀ those who had fewer other people present ($\bar{x}$ =.60)		
❀ those who had fewer non-compliant people present ($\bar{x}$ =.18)		
❀ those with smaller party sizes ($\bar{x}$ =3.58)		
❀ those who visited the	Longmire Museum	(66%)
	Paradise Visitor Center	(59%)
❀ those exposed to	naturalist's programs	(70%)
	contact with a park ranger	(60%)
	indoor exhibits	(59%)

Individuals who did not comply with the minimum impact hiking recommendations can be described as follows. The majority of the following groups were *non-compliers* (all relationships shown were statistically significant):

❀ message non-recipients		(64%)
❀ persons aged	21 - 30	(57%)
	65+	(67%)
❀ Asian Americans		(78%)
❀ residents of King and Pierce Counties, Washington		(59%)
❀ those hiking with	family and friends	(51%)
	friends	(53%)
	organized group tours	(94%)
❀ those who had more other people present ($\bar{x}$ = 1.34)		
❀ those who had more non-compliant people present ($\bar{x}$ = .68)		
❀ those with larger party sizes ($\bar{x}$ = 4.10)		
❀ hiking parties with children	aged five to ten	(72%)
	aged eleven to fifteen	(60%)
	aged under five	(56%)

Conclusions and Implications

Management Implications

The intent of this study was to test the effectiveness of a verbal interpretive message in deterring off-trail hiking at Mount Rainier National Park. The most important implication of this study is that a verbal interpretive message about minimizing hiking impacts, designed to challenge individuals at various stages of moral development, is related to hiker behavior. The results of this study confirm findings of previous research that personal contact with the message deliverer is the most effective interpretive method to induce behavioral changes (Wagstaff and Wilson 1988).

Interpretation can be successfully employed to reduce off-trail hiking impacts at Snow lake. Practical interpretive methods that affect hiker behavior need to be developed and implemented. Ideally, a ranger or volunteer would be stationed at the most heavily used trailheads to provide a message similar to the one used in this study. The appeal of personal contact and the temporal proximity of the message delivery and hike initiation should produce substantive effects on behavior.

A substitute for trailhead interpretation is the delivery of minimum impact appeals by interpreters in the visitor centers. The findings of this study show that personal contact with a park ranger influenced hikers to be more compliant. Findings suggest that visitors to some visitor centers are more likely than the entire population to be compliant. Although the exact media to which visitor center visitors were exposed is unknown, it is possible that messages provided by interpretive rangers at information desks persuaded hikers to stay on the trails. The personal contact provided by rangers delivering messages to visitors who request trail information should be effective in deterring off-trail hiking.

Other interpretive techniques, although not tested for their effectiveness during this study, should be implemented to reach those visitors who do not go to visitor centers. One such option would be to inform visitors through trailhead bulletin boards. The bulletin boards would serve as a reinforcement for individuals who received the verbal message, and the boards could provide site specific information. Trailhead bulletin boards should be visually attractive and interpretive, not mere lists of rules and regulations. The temporal proximity of this message exposure technique to hike initiation should prove to be successful. Not all hikers however will read bulletin boards, especially those who have familiarity with or have previously visited the area. Methods by which to reach local residents presents a concern.

Interpretation using brochures is another method by which to deliver minimum impact appeals. Brochures can be used to reach visitors who request trail information by mail. Communication via mail may be the only means of direct correspondence for some visitors who do not visit visitor centers. Fazio and Ratcliffe (1989) emphasize that responses to mail inquiries from the public are not being fully utilized for dissemination of resource protection information. Exposure to brochures was not related to compliance in this study. This finding is not surprising, because most visitors receive the official park map/brochure upon entering the park. The park map/brochure does not contain minimum impact hiking information. In addition, no other brochures were being utilized for minimum impact hiking information dissemination. Lucas (1981) warns that brochures may fail if the focus is too narrow, if they do not contain information about enjoying the park, or if the readers are already familiar with the topic. He also explains that visitors may not read the brochure before embarking on their hike, if the brochures are distributed at the park. Stolarz (1984) has found that brochures are less effective than other interpretive methods in some situations in encouraging desired behavior changes.

Compliance with minimum impact messages may be increased through several other strategies. Christensen and Clark (1983) explain that single solutions are rarely effective in producing minor rule compliance. Comments made by several hikers suggest that improved trail design may increase compliance. Several hikers suggested that off-trail hiking would be reduced if trails were built to good photography spots, lakeshores, overlooks, and points of interest where visitors are tempted to go. Places for hikers to stop and rest should also be incorporated into trail design. Others suggested providing a designated trail around the lake and placing boardwalks over sensitive areas. Perhaps some of the social trails could be upgraded and designated as official trails.

Additionally, improving trail markings and camouflaging social trails should encourage compliance. The existing social trail network is extensive, and creates a confusing scenario for hikers who intend to comply with minimum impact hiking recommendations. Many of these trails access the lakeshore or are trail links encircling the lake. Some social trails lead to nowhere, while others are intermittent. Hikers may experience difficulty in distinguishing between developing social trails, well established social trails, and National Park Service designated trails. A well intentioned hiker may easily be lead off-trail by following a social trail. A standardized system for designated trail marking could prevent this problem, if undesirable social trails are blocked off or masked.

Existing trail signage is problematic. A sign exists along the National park Service designated trail which reads "END OF THE MAINTAINED TRAIL - Travel Safely Causing Minimum Impact Beyond Here." The trail continues unchanged for quite a distance beyond the sign before fading. These directions are confusing to the hikers. Individuals instructed to walk on rocks when they leave the trail may believe that they should commence these minimum impact hiking practices immediately after passing the sign. This sign placement may have confused some hikers and consequently lowered compliance rates. Perhaps this sign should be moved to the actual end of the trail, and the text should remind hikers to disperse their impacts, walk on rocks, and avoid trampling vegetation.

Recommendations for Further Research

It is desirable that the effects of interpretive messages are lasting. Further research should be conducted to determine if hikers retain minimum impact knowledge after their visit and whether the effect of the interpretive message on hiker behavior continues during other hiking trips at the park.

This study needs to be replicated in distinctly different areas of Mount Rainier National Park. Since Mount Rainier is a relatively large park, different park areas are considerably isolated from each other and may draw visitors from separate local populations. Other highly impacted day use sites deserve further investigation. The findings of this study are site specific and can not be generalized to all locations, conditions, behaviors or situations.

In addition to replicating this study at a variety of hiking sites, the study should be replicated using a variety of interpretive media. Various interpretive media need to be tested for their relative effectiveness in influencing minimum impact hiking behavior. The results of this study indicate that verbal messages are in some way related to hiker behavior; however, for logistical reasons interpreters are unlikely to be stationed at each trailhead to deliver minimum impact messages. Practical interpretive methods such as trail signage, trailhead bulletin boards, brochures informing visitors of conforming trail behavior, messages provided by hiker information center rangers, automated slide programs, indoor exhibits, and naturalist's programs should be evaluated separately and in combination to identify useful strategies to minimize recreational impacts.

Finally, naturalist's programs were identified as interpretive media which have a powerful influence on hiker behavior. It would be beneficial to evaluate why certain visitors choose to attend naturalist's programs while others do not. Park managers can learn ways of adapting current programs to better meet the needs of park visitors. Such information would be useful in marketing park programs to attract greater attendance. Increased attendance can only produce a greater proportion of informed constituents who are likely to become resource stewards -- advocates of park protection. Park naturalist's programs need to sensitively address important threats to the park's environmental quality, while providing positive solutions and practical means for the visitor to make a difference.

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Economics



FACTORS AFFECTING THE VALUE OF A WILDERNESS VISIT: A CONTINGENT VALUATION STUDY OF CARIBOU-SPECKLED MOUNTAIN WILDERNESS USERS

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A dichotomous choice contingent valuation model is estimated using an on-site survey of Caribou-Speckled Mountain Wilderness visitors. The results indicate that pre-trip expectations of various trip attributes such as congestion have a greater impact on a trip's value than the actual conditions of the visit. This research also shows that future economic studies of an area's non-market value can yield valuable information to managers about the characteristics and preferences of wilderness visitors.

Introduction

Land designated wilderness in the Eastern United States is very different than wilderness areas in the West. Unlike the West, Eastern wilderness has usually been logged in the past, and has historically been used for a variety of recreational purposes not generally associated with wilderness. Consequently, the challenge for the Eastern wilderness managers is not to preserve a wilderness, but to "grow" or "manufacture" wilderness where it has not existed in the past.

Designated in 1990, the Caribou-Speckled Mountain Wilderness (CSMW) is the White Mountain National Forest's latest contribution to the national wilderness system. A 12,000 acre tract located in Western Maine, the CSMW is best known for the open peaks of Caribou and Speckled Mountains and the waterfalls and slides along the brooks followed by the area's hiking trails. Typical of Eastern wilderness, the CSMW has been intensely logged three times in the past century, and one of its most popular recreation activities prior to wilderness designation was snowmobiling to the top of Speckled Mountain on a tote road leading to an abandoned fire tower. Its managers are now faced with creating a wilderness feel ing in the area, and have developed a wilderness implementation schedule to accomplish this goal.

Managers often speak of the dual goals of abiding by the wilderness implementation schedule and maximizing visitor satisfaction or benefits. Maximizing the benefits or satisfaction of visitors requires managers to have a knowledge of what aspects of a CSMW visit contribute significantly to its value. The wilderness implementation schedule of the CSMW calls for the removal of all non-conforming (human-made) structures and reductions in the amount of directional signs and trail maintenance. Whether or not the goals of the wilderness implementation schedule are in harmony with the goal of maximizing visitor benefits depends on how human-made structures, directional signs and trail maintenance affect a trip's value.

Perhaps more important than the freedom from the physical signs of human influence as laid out by the wilderness implementation schedule, the benefits of wilderness recreation are affected by the level of solitude experienced by visitors. Most studies of wilderness benefits focus on the affects of crowding and congestion. The first visitor to a wilderness area experiences perfect solitude, but each additional user reduces the enjoyment of all users because solitude is reduced. Fisher and Krutilla (1972) have explained this relationship in terms more familiar to an economist, " As long as the gain from admitting additonal numbers exceeds the loss due to congestion costs, aggregate net benefits will increase. Beyond a point the congestion costs exceed the gains experienced by the additional recreationists and total net benefits diminish. Optimal capacity is the point at which the total benefit is a maximum and the incremental or marginal benefit is zero." When studied by economists, the satisfaction or benefit derived from outdoor recreation is generally measured in terms of willingness-to-pay (WTP).

The effect of crowding on WTP was first studied by Charles Cichetti and Kerry Smith in the mid 70's. Cichetti and Smith (1974) mailed surveys to 600 Spanish Peaks (MT) users and had them respond their WTP to a variety of hypothetical recreational experiences which varied by the number of trail encounters, camp encounters and length of stay. They found both camp and trail encounters to have significant, negative impacts on willingness-to-pay. Subsequent studies (McConnell and Sutinen 1984, Shelby 1980) have further demonstrated this negative relationship between encounters and WTP. Congestion is usually defined as the total number of encounters, but may be better represented by the rate of encounters. People on a short hike probably have a lower tolerance for the total number of encounters than those on a longer trek. Thus, the WTP model in this paper uses both total encounters and encounters per hour of hiking as measures of congestion.

In addition to the affect of actual congestion, the role of prior expectations of crowding on WTP have been investigated (Prince and Ahmed 1988, Menz and Mullen 1980). It is believed that the failure of models such as Cichetti and Smith to account for unrealized expectations of crowding has a downward bias on WTP. Collecting information on prior expectations in a post-visit interview poses some data collection problems. The response to the expectations question immediatly following the visit, as done by Prince and Ahmed, is likely to be affected by the actual conditions. The response to an expectations question immediatly preceding a hike may be affected by the number of cars or the perceived level of crowding at the trailhead. Despite data collection difficulties, expected crowding has been shown to have some impact on WTP.

Table 1. Independent variables in the WTP logit model.

Variable Name	Expected Sign	Variable Definition
BID	-	$ amount presented to respondent
Trip characteristics		
$SPENT	+	total trip-related expenditures
LENVIS	+	time spent in CSMW in hours
ENC	-	# encounters with other groups
ENC PER HOUR	-	# encounters per hour spent in the CSMW
EXENC	-	# encounters Dummy variable (1=more than expected, 0=about as ex, -1 = less than ex)
EXWILD	+	amount of wildlife seen Dummy variable (1=more than expected, 0=about as ex, -1 = less than ex)
Site characteristics		
EXMM	-	# of man-made structures Dummy variable (1=more than expected, 0=about as ex, -1 = less than ex)
EXTRMT	-	level of trail maintenance Dummy variable (1=more than expected, 0=about as ex, -1 = less than ex)
EXSIGN	-	# of directional signs Dummy variable (1=more than expected, 0=about as ex,-1=less than ex)
Visitor preferences		
MORWILD	-	seeing wildlife or signs of wildlife (3=very imp., 2= somewhat imp., 1= not important)
FEWENC	-	seeing few other groups (3=very imp., 2= somewhat imp., 1= not important)
NOMM	-	no man-made structures in CSMW (3=very imp., 2= somewhat imp., 1= not important)
GOODTR	+	condition of trail system in CSMW (3=very imp., 2= somewhat imp., 1= not important)
FEWSIN	-	fewer directional signs in CSMW (3=very imp., 2= somewhat imp., 1= not important)
User characteristics/ Demographics		
HIKTR	-	#of hiking trips in past 12 months
CSMVIS	-	# of visits to CSMW in past 2 years
INC	+	total household income in 1992
EDUC	+	# of years of school completed
MEM	+	member of environmental group (1=yes, 0=no)
AGE	?	age of respondent in years
FEM	?	sex (1=female, 0=male)

Similar data collection problems confound efforts to include physical site condition variables mentioned earlier such as trail maintenance, man-made structures and the amount of directional signs. While the condition of a given trail may be the same for all visitors, its performance or effect on WTP is different. Asking people to make a subjective evaluation of quality has the problem of keeping people on the same scale (one person's good may be another's poor). Evaluating the effect of unrealized expectations of physical characterisics on WTP in a way similar to that done with congestion may be a good way to evaluate the importance of these various characteristics.

Most of these previous studies have used open-ended or iterative bidding games to elicit WTP. Recently, dichotomous choice contingent valuation in which an individual responds yes or no to whether they would be willing to pay. In this study, for example, respondents were asked if they would still have visited if their expenses had been $X more? The advantages of dichotomous choice questions is their similarity to more familiar "take it or leave it" style transactions, and that it avoids the starting point bias of iterative bidding games.

In this study, dichotomous choice contingent valuation is used to measure the value of a visit to the Caribou-Speckled Mountain Wilderness. The dichotomous choice contingent valuation model used for this study estimates the probability an individual would pay a given amount to retain their opportunity to visit the wilderness. It is estimated with a logit model as this is consistent with utility theory (Hanemann 1984; Loomis 1988). The theoretical logit model for CSMW users is

$$\log[p(yes)/1-p(yes)] = f(BID,TC,SC,PR,DEM) \qquad (1)$$

where BID is the dollar amount presented to the respondent, TC is a set of visit characterisitics, SC is a set of site characteristics, PR are the respondents preferences for various wilderness conditions, and DEM is a vector of user characteristics and demographic data. All the variables are defined together in Table 1.

Data Collection

Between June 15, 1993 and September 15, 1993, CSMW visitors were surveyed at trailheads as they left the wilderness area. Three sites (Caribou parking area, Brickett Place, and Stone House parking area) were each sampled for eighteen days, twelve weekdays and six weekend days at each site. The interviewer approached every recreational (non-commercial) group leaving the wilderness. Of the 259 groups encountered, only one group refused to complete the survey. A summary of the descriptive results of the survey is shown in Table 2. After removing unusable surveys due to missing data, a total of 171 observations were included in the Logit analysis.

Table 2. Selected summary statistics of survey respondents.

Average time in wilderness area	4.97 hours
Average number of encounters	4.27
Average encounters per hour	.88
Average expenditures for visit	$42.15
Previously visited CSMW	63.2%
Average Age	39.8 years
% Female	37.4%
Member environmental organization	52.6%
Average annual household income	$58,406

N=171

Logit Results

The results of the logit models are shown in Table 3. Column one shows the results when congestion is defined as total encounters, and column two uses encounters per hour as a measure of congestion.

None of the visitor preference or demographic characteristics are statistically significant. The inverse relationship between the bid amount and WTP is significant and expected. The significance of three of the five expectations variables is the most striking result. The difference between actual encounters and expected encounters is significant and signed as expected as is the difference between actual and expected number of human-made structures. While neither encounters or encounters per hour are statistically significant, it is noteworthy that encounters per hour performed better than total encounters.

Total expenditures is positively signed and significant, indicating that respondents were more willing-to-pay the additional amount if it was a smaller portion of their total expenditures. The significance of the expected encounters and insignifcance of the two actual encounters variables, indicate that the expected level of congestion is more strongly related to WTP than the actual level of congestion itself. The difference between expected and actual levels of trail maintenance and directional signing do not have as significant effect as wildlife and man-made structures.

Table 3. Results of logit model. (t- ratios in parenthesis)

Variable Name	(1)	(2)
CONSTANT	-1.220	-.761
	(-.56)	(-.34)
BID*	-.0492	-.0493
	(-5.33)	(-5.32)
Trip characteristics		
$SPENT*	.0119	.0118
	(2.21)	(2.18)
LENVIS	.194	.155
	(1.37)	(1.15)
ENC	-.0478	(-.48)
ENC PER HOUR	-.525	(-1.03)
EXENC*	-.950	-.882
	(-2.38)	(-2.19)
EXWILD*	-.841	-.872
	(-2.28)	(-2.36)
Site characteristics		
EXMM*		-1.084
	-1.041	
	(-1.99)	(-1.91)
EXTRMT	.300	.347
	(.78)	(.39)
EXSIGN	.272	.248
	(.69)	(.63)
Visitor preferences		
MORWILD	.201	.232
	(.49)	(.57)
FEWENC	.159	.138
	(.442)	(.384)
NOMM	.117	.082
	(.36)	(.25)
GOODTR	-.171	-.157
	(-.45)	(-.42)
FEWSIN	.215	.268
	(.58)	(.72)
User characteristics/ Demographics		
HIKTR	-.0625	-.0581
	(-1.02)	(-.95)
CSMVIS	-.372	-.330
	(-.72)	(-.63)
INC	.00000473	.00000480
	(.66)	(.67)
EDUC	.0612	.0525
	(.27)	(.23)
MEM	.307	.277
	(.62)	(.56)
AGE	.00642	.00388
	(.29)	(.18)
FEM	.234	.275
	(.51)	(.59)
McFadden R^2	.387	.391
N	171	171

* indicates significant at the 95% level

Discussion and Implications

This study shows that a wilderness visitors pre-trip expectations may be more important to a visit's value than the actual visit characteristics . If this is the case, it indicates that wilderness managers can enhance backcountry experiences by making more and better planning information available, so that potential visitors are able to have more accurate expectations of an area. Very little study has been done on the how backcountry visitors develop their expectations about the expereience. Further study on the formation of pre-trip expectations is necessary before good suggestions can be made as to how wilderness managers can help visitors form more accurate expectations before their visit.

As debate over the use of public lands intensify, there will likely be more studies of the non-market and recreational value of wilderness areas. This study shows that studies of economic value for wilderness areas can yield valuable information about visitor preferences for area managers if properly designed before hand. These results can even be extended to determine the use level which maximizes the area's total use value (see Cichetti and Smith 1973; Michael 1994). By getting involved in these economic studies, wilderness managers can utilize a valuable source of information on user characteristics, preferences and attitudes.

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SECTOR ANALYSIS OF ECONOMIC IMPACTS FROM HERITAGE CENTERS

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The economic impact of six of America's Industrial Heritage Project visitor centers was evaluated within a nine-county region of Pennsylvania. The total sales impact of these expenditures was $29.2 million. Over 60% of the direct sales impact was in the lodging and food service sectors. The labor-intensive character of both sectors created a substantial induced impact within the region. Although both sectors generated considerable employment within the region, their pay scales were below the regional average.

Introduction

The Southwestern Pennsylvania Heritage Preservation Commission contracted with The Pennsylvania State University in 1991 to determine the economic impact of its Heritage visitor centers. Each year, a particular set of centers is evaluated in terms of their regional impact and visitor characteristics. This year-by-year build of information will provide an overview of the entire Heritage system and an ability to project its future economic and marketing features.

The 1992 study included six Heritage centers with an annual visitation of over 330,000 non-resident tourists (Strauss et al. 1993). During their stay this audience spent $15.1 million. In turn, these expenditures generated a direct sales impact of $10.5 million and secondary sales impacts of $18.7 million. On a value added basis, this represented an $18.8 million net gain to the regional economy, with $11.8 million directed to wages and salaries in support of 844 annual jobs.

These results suggested the need to further evaluate the principal sectors receiving these impacts and their commercial linkages with other sectors. This review will also consider the economic prerequisites for growth in Heritage tourism and related policy issues in reaching this potential.

Procedures

In the 1992 study, visitors were surveyed at five Heritage centers during the June to mid-October tourist season. This included the Allegheny Portage Railroad National Historic Site, Horseshoe Curve National Historic Landmark, Johnstown National Flood Memorial, Johnstown Flood Museum and Johnstown Inclined Plane. On-site interviews were conducted to secure the respondent's socio-demographics and related trip information, with mail-back questionnaires used to obtain further details on trip expenditures. Over 2000 interviews were taken at the five visitor centers with 1766 questionnaires returned, representing a response rate of 83%. A sixth center, Altoona Railroaders Museum, was added to the 1992 study on the basis of having been surveyed in an identical fashion during 1991.

Average expenditures per visitor day were identified for the resident and non- resident visitors at the individual centers and for the types of purchases these people made within the nine-county region. Expenditures were also prorated among the different travel destinations identified on the visitor's travel itinerary. Total regional expenditures for non-resident visitors were built on the basis of the annual attendance records from the individual centers.

The financial impact of Heritage-related expenditures was modeled with the Impact Analysis for Planning (IMPLAN) System. The IMPLAN model was originally constructed for the USDA Forest Service to estimate the regional economic impacts of National Forest management plans (Alward et al. 1985). The model is based upon a national technology matrix describing the interrelationships between as many as 528 economic sectors in any particular economy. IMPLAN then uses county specific economic data to produce input-output models on a county-by-county basis, or for any aggregate region within the U.S.

Final demands, or direct sales, were analyzed by IMPLAN in terms of two types of secondary impacts; (1) the indirect impact upon sectors having commercial linkages to the direct and other indirect sectors and (2) the induced impact from the income spent by households employed in the direct and indirect sectors. The combination of direct, indirect, and induced impact was measured in terms of the total sales of goods and services, the value added to the region's economy, and annual employment.

The expanded analysis of impacts in this paper focused on the 1992 Heritage study (Strauss et al. 1993). Included are a review of the key sectors involved in the major types of economic impact and the input-output structure of these sectors. This effort also considers the growth potential of the Heritage system and related policy considerations.

Results

Overview of the 1992 Study

For the six Heritage centers, the direct sales impact was $10.5 million, with 85% placed in two groups of economic sectors; the Service group and the Wholesale and Retail Trade group (Table 1). An additional 12% of the direct impact was distributed among three other groups; Transportation /Communication/Utilities, Government Enterprises, and Manufacturing. Secondary sales of $18.7 million contributed to a total of $29.2 million for 1992 (Table 1). The major groups involved in this secondary process were: Finance/ Insurance/Real Estate with 27% of the secondary sales, Services with 25%, and Wholesale and Retail Trade with 19%.

Impact by Sector

The principal sectors receiving direct impact from Heritage tourism were Hotel and Lodging Places, Eating and Drinking Establishments, and Other Non-profit Organizations (Figure 1). Together, these three sectors captured 77% of the direct impact, with the remaining impact parceled in relatively small shares to over 30 other sectors. The non-profit sector largely represented the combination of public and private Heritage centers.

The relative importance of lodging and food services paralleled the expenditure profile of the non-resident visitor (Strauss et al. 1993). Nearly 60% of their expenditures were for lodging and food services, with 17% directed to travel costs (largely gasoline purchases), 10% to site-related costs, and 13% to other purchases. However, since gasoline was an out-of-region product, only a small proportion of these expenditures was credited as direct sales to the region. As such, the percentages of direct impact for lodging, food services, and site costs were higher than for those of expenditures.

Table 1. Total regional impact of six AIHP visitor centers, 1992.[a]

Economic Group	Direct Sales	Total Sales	Value Added	Employee Income	Employment
Agriculture, Forestry & Fisheries	$41,300	$457,800	$141,800	$50,900	8.01
Mining	$35,100	$78,200	$59,700	$10,400	0.36
Construction	$55,300	$739,300	$415,300	$314,500	15.25
Manufacturing	$325,100	$2,144,900	$725,500	$470,100	22.11
Transportation, Communications and Utilities	$465,400	$2,375,600	$1,327,400	$603,300	28.20
Wholesale and Retail Trade	$3,723,500	$7,266,800	$5,098,200	$3,734,800	374.38
Finance, Insurance & Real Estate	$208,600	$5,240,800	$3,691,800	$595,600	32.89
Services	$5,235,300	$9,914,300	$5,336,900	$4,064,500	298.31
Government Enterprises	$456,700	$990,000	$727,100	$660,000	15.02
Special Industries	$0	$0	$0	$0	0.00
National Park Service			$1,298,650	$1,298,650	50.00
Total	$10,546,300	$29,207,700	$18,849,350	$11,802,750	844.53

a/ Source: Strauss, C. H., B. E. Lord and S. C. Grado. 1993. Economic Impact and User Expenditures from Selected AIHP Visitor Centers, 1992.

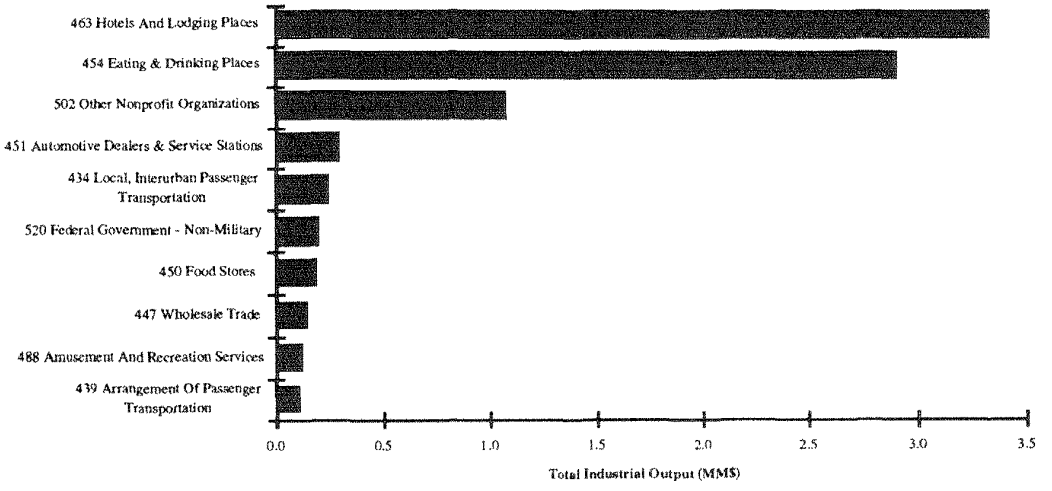


Figure 1. Direct sales impact by sector from AIHP Tourism, 1992.

Secondary impacts were of interest due to their size and distributions between indirect and induced impacts. As previously identified, secondary sales impacts were $18.7 million, with 11% originating from indirect impacts and 89% from induced impacts. Herein, is an important structural characteristic of tourism. Most of the direct impacts were placed in the lodging and food service sectors. Both sectors were labor intensive and had limited secondary ties with other regional sectors. Their labor dependency was also evident in the large induced impact.

In contrast to the direct impacts, indirect impacts were distributed over a wide variety of sectors. The three lead sectors; Maintenance and Repair Services, Electric Services, and Real Estate only had 25% of the indirect impact (Figure 2). Indirect impacts among the ten lead sectors were still under 50% of the total. For the most part, indirect sectors were also labor intensive and could be characterized as service trades in the business, maintenance, and communication fields.

Induced impacts were also distributed over a wide range of sectors, with the ten lead sectors capturing only 53% of this activity. The distribution of induced impacts followed the personal consumption pattern of the U.S. population (BEA 1992). The top sector was Owner-occupied Dwellings, representing household payments to the equity and maintenance of homes (Figure 3). This sector received nearly 16% of the induced impacts from IMPLAN and it represented 15% of personal expenditures for the U.S. (BEA 1992). Health care received the second largest induced impact. Hospital and doctor/dentist expenditures were 12% of induced impacts from IMPLAN and 10% of personal expenditures for the U.S.

Analysis of Key Sectors

Over 60% of the direct sales impact from non-resident Heritage tourists went to Sector 454, Eating and Drinking Establishments (EDE) and Sector 463, Hotel and Lodging Places (HLP). Within the nine-county region, the total output for Eating and Drinking Establishments was $373 million (Table 2).

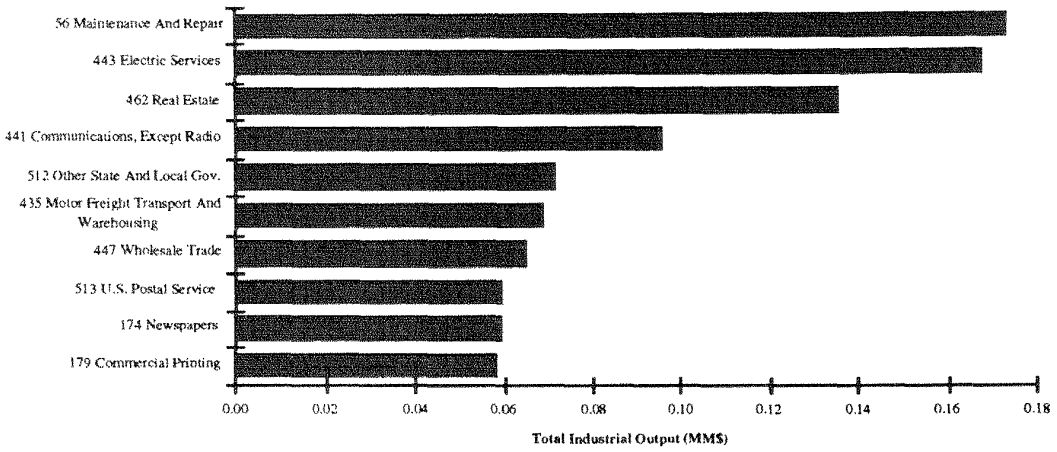


Figure 2. Indirect sales impact by sector from AIHP Tourism, 1992.

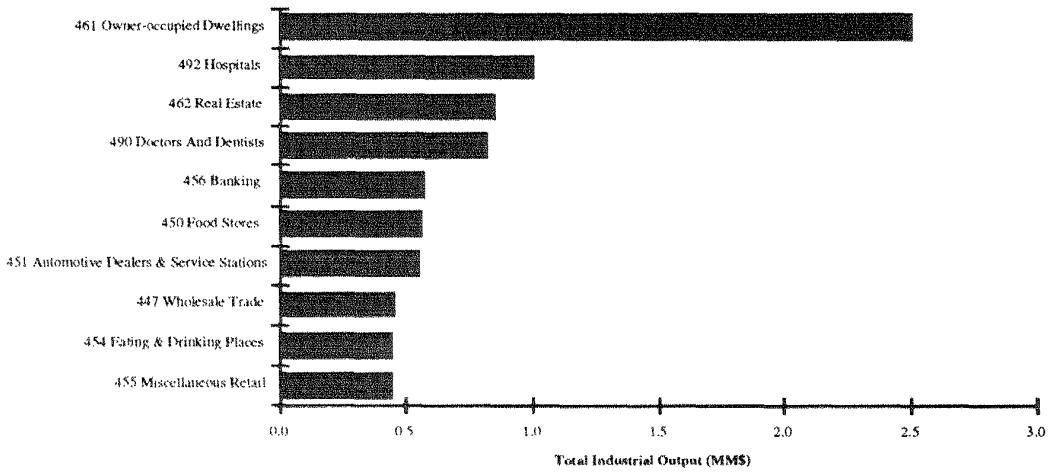


Figure 3. Induced sales impact by sector from AIHP Tourism, 1992.

Table 2. Financial profile of sector 454, eating and drinking establishments, and sector 463, hotel and lodging places.a,b

	Sector 454 ($MM)	Sector 463 ($MM)
Inputs to Sector	160.39	38.91
Employee Compensation	196.47	50.52
Indirect Business Tax	34.91	7.41
Proprietary Income	16.87	-2.83
Other Property Income	-35.32	12.79
Total Value Added	212.94	67.90
Total Sector Output	373.33	106.80

a/ Source: 1990 IMPLAN model for a nine-county southwestern Pennsylvania region.
b/ Note: Total sector output equals value added plus inputs to sector. Negative values in Other Property Income and Proprietary Income represented insufficient income to cover property rent and self employed salaries, respectively.

In comparison, the total impact of Heritage tourism on EDE ($3.4 million) was about 1% of this sector's regional output. Employee compensation within this sector was 53% of its total output. In contrast, employee compensation across all sectors in the region averaged 33% of total output. The cost of intermediate inputs to EDE from all other sectors was 43% of EDE's total output.

The twenty lead input sectors to EDE provided 67% of EDE's intermediate input costs (Table 3). About 70% of this input was food products, with the remaining 30% coming from business and utility services. However, only 30% of all input was purchased within the region.

Table 3. Twenty lead input sectors to Sector 454, Eating and Drinking Establishments.[a]

Sector	Gross Input ($MM)	Regional Input ($MM)
Vegetables	5.33	3.01
Meat Packing Plants	6.34	2.24
Sausages and Other Prepared Meats	6.71	.96
Poultry Processing	6.58	.00
Creamery Butter	3.57	.72
Cheese Products	7.15	1.35
Ice Cream	2.98	1.72
Pickles/Sauces	3.56	.01
Frozen Specialties	9.97	3.79
Malt Beverages	5.40	2.00
Soft Drinks	2.84	1.05
Seafood	11.02	.00
Food Prep, N.E.C.	3.80	.16
Electric Service	5.71	3.42
Wholesale Trade	6.84	3.42
Real Estate	6.99	2.90
Advertising	4.61	3.26
Other Business Services	2.81	.94
Personnel Supply Services	2.99	.49
Mgt/Consult. Services	2.95	.92
Totals	108.15	32.36

a/ Source: 1990 IMPLAN model for a nine-county south-western Pennsylvania region.

Table 4. Twenty lead sectors providing input to Sector 463, Hotel and Lodging Places.[a]

Sector	Gross Input ($MM)	Regional Input ($MM)
Landscape Services	.72	.39
Maintenance, Other Facilities	2.43	2.35
Petroleum Refining	.58	.02
Misc. Plastic Products	.69	.00
Communications, except radio/TV	3.10	1.55
Electric Services	5.02	3.01
Gas Production and Dist.	.89	.70
Water Supply/Sewerage Systems	1.06	1.06
Credit Agencies	.86	.68
Real Estate	4.15	1.72
Advertising	3.07	2.17
Other Business Services	1.06	.36
Services to Bldg.	.62	.38
Personnel Supply Services	2.03	.37
Legal Services	1.07	.28
Acctg. Services	.62	.34
Mgt. Services	1.32	.41
R&D Services	.83	.59
Other State Enterprises	.79	.56
U.S. Postal Services	.59	.42
Totals	31.50	17.36

a/ Source: 1990 IMPLAN model for a nine-county south-western Pennsylvania region.

Hotel and Lodging Places had a total output of $107 million in the nine-county region (Table 2). The impact from Heritage tourism ($3.5 million) represented 3% of this sector's total regional output. Employee compensation was 47% of total output, also above the regional average of 33%. Inputs from all other sectors were 36% of HLP's total sales. The twenty lead input sectors to HLP provided 81% of all input (Table 4). Nearly 55% of this input was purchased from regional suppliers. Most of these inputs were business, utility, and communication services.

Summary

The direct sales impact from Heritage tourism was largely channeled into two sectors; Eating and Drinking Establishments and Hotel and Lodging Places. The indirect impact of these sales on other regional sectors was modest. In the case of Eating and Drinking Establishments, about 30% of their input was purchased regionally, and for Hotel and Lodging Places about 50% was from regional suppliers.

Both sectors were labor-intensive, devoting nearly 50% of the their total sales value to employee compensation. In turn these wages and salaries generated a substantial induced impact in other retail and service sectors.

Conclusions

Over the next ten years, the addition of seven new Heritage centers and an increased attendance at all other centers should generate 1.8 million visitor days of use by the year 2003 (Strauss and Lord 1993). Annual regional expenditures from non-resident visitors are estimated at $105 million. Assuming the region maintains the same level of economic self-sufficiency, these expenditures would provide a total impact of $185 million.

This expansion would represent a six fold increase to the impacts found in Table 1. In terms of the two leading sectors, this would increase regional sales to Hotel and Lodging Places by 16% and to Eating and Drinking Establishments by 5% (based upon the 1990 IMPLAN model). In turn, this would generate nearly 1900 new jobs within these two sectors.

Although the lodging and food services sectors have a positive effect upon regional employment, they also represent a lower paying and seasonal source of employment. A comparison of the key employment sectors within IMPLAN, found these sectors below the regional average of $19,991 per job (Table 5).

Table 5. Major Employment Sectors within the AIHP Region.[a]

Sector	Total Output (MM$)	Employee Compensation (MM$)	Employment (# jobs)	Annual Comp/Job ($/jobs)
State/Local Govt.	876.8	876.8	28,291	30,992
Eating/Drinking Est.	373.3	196.5	24,968	7,869
Wholesale Trade	902.2	522.5	19,660	26,577
Hospitals	1,052.3	436.1	17,440	25,006
State/Local Govt.	303.2	303.2	16,335	18,564
Food Stores	343.3	162.6	15,825	10,273
Main./Repair	520.9	250.1	11,774	21,240
Auto Dealers/Service	364.8	184.3	11,472	16,062
Labor/Civic Organ.	113.7	73.8	10,857	6,799
Gen. Merch. Stores	229.9	127.5	10,283	12,403
Motor Freight	610.5	217.7	9,992	21,787
Doctors/Dentists	483.2	273.8	7,872	34,784
Indust/Comm. Const.	513.7	143.2	6,655	21,515
Residential Const.	580.9	92.3	6,421	14,377
Coal Mining	621.3	292.0	6,238	46,813
Engin/Arch.	404.0	199.6	6,124	32,593
Hotel/Lodge Places	106.8	50.5	4,275	11,818
All Regional Sectors	26,793.7	8,753.2	437,857	19,991

a/ Source: 1990 IMPLAN model for a nine-county southwestern Pennsylvania region.

One of the potential challenges to tourism is identifying the general character of its employment market. This includes the types of job opportunities and assignments, educational and training needs, and the communications network between workers and employers. Local government could also assist this process by offering job training programs at high schools and vo-tech centers geared to the tourism industry. A coordinated effort among business and government could upgrade the calibre and stability of employment within these sectors and raise the general welfare and expectations of these people.

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TECHNIQUES FOR ASSESSING EXTRAMARKET VALUES

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Central to effective policy development and management of natural resources is an understanding of the trade-offs stakeholders are willing to accept and the values they hold. Although market prices reflect society's preferences to some degree, they clearly do not encompass all values or costs. Conjoint techniques offer a means to estimate and analyze stakeholder preferences.

Introduction

Demands on the planet's resources are intensifying as the earth's population expands by an astounding 93 million annually (Postel 1994). Growth in the consumption of many resources exceeds population growth and per-capita consumption for many goods will continue to rise as countries like China and India industrialize and demand a bigger slice of the consumptive pie (Durning 1994). These trends have led to a host of environmental concerns: lost biodiversity, species extinction, global warming, reduced water availability and quality, and many others.

Paralleling increased demands for goods is a realization that quality of life depends on more than pure consumption. This is reflected in society's views about how resources should be managed and is evident, for example, in the USDA Forest Service's emphasis on ecosystem management. Society is demanding more preservation, more environmental protection, and enhanced management for aesthetics, biodiversity, and wildlife habitats, but we also want to consume and recreate more. In short, we want more of everything from a shrinking resource.

Difficult choices must be made. Decision-makers need guidelines for determining the optimal way to allocate increasingly scarce resources. In a capitalistic society we generally look first to the market place to help allocate resources. Markets work to allocate some goods efficiently but fail dismally for others. There are many examples where markets fail to provide the appropriate allocation signals (prices). Two types of market failures that are of concern to resource managers have to do with the public good or common property nature of forest-related benefits and the presence of externalities. Both interfere with the ability of the price system to allocate resources efficiently. The nonexclusive or common nature of public goods (e.g., the air or water purifying benefits of forest ecosystems) provides an incentive for individuals to "free ride" by refusing to pay with the hope that others will provide this benefit. Externalities refer to interactions among firms or individuals that are not fully reflected in market prices. For example, damage to water quality, scenic vistas, wildlife habitats, or lost biodiversity are costs to society that are not fully accounted for in the market price of timber or recreation. There are many other examples of externalities that, in general, refer to costs or benefits that are not fully reflected in market transactions. The presence of market failures has been a strong argument in favor of public ownership of forest land. Public ownership effectively removes land from direct response to market signals.

When markets fail to provide the appropriate signals, there may be no clear guidelines for managers and they become caught in a lose-lose situation. No matter what they do, they fail to meet the expectations or desires of special interest groups and certain publics. This situation often leads to expensive and time-consuming litigation. Managers seek a systematic and rational means to analyze decisions that involve a wide range of biophysical, financial, social, and moral variables.

Central to effective policy development and decision-making is an understanding of the trade-offs stakeholders are willing to accept and the values they hold. Society has expressed that nonmarket benefits and costs are important and must be considered. A means is needed to translate society's preferences into meaningful goals and guidelines for decision-makers to follow. Conjoint techniques offer a tool for increasing our insight in this area.

Conjoint Analysis

Conjoint analysis, a technique used to measure psychological judgments, is frequently used in marketing studies to measure consumer preferences (Green et al. 1988). Respondents are asked to make choices between alternate products or scenarios with varying levels of selected attributes. For example, in a typical marketing application, an automobile manufacturer might be interested in consumer's preferences for certain features or attributes. The manufacturer may want to examine prospective consumers' willingness to accept decreased gas mileage for increased cargo space or their preferences for reduced prices or increased warranty length. Prospective consumers could be asked to choose between or rank their preferences for vehicles with various combinations of cargo capacity, gas mileage, warranty length, price, and other attributes of interest.

These data, which outline a respondent's preferences or the trade-offs he or she is willing to make, can be used to construct a predicted set of utilities for various factor or attribute combinations. Although the respondent evaluates complete bundles of attributes, conjoint techniques can be used to solve for the partial utility function for each attribute that is imputed from the overall trade-offs. These partial utilities can be combined to estimate any combination of interest, thus providing high leverage between the options actually evaluated and those that can be evaluated after the analysis.

A simplified hypothetical example will be used to illustrate the potential usefulness of conjoint techniques to resource or recreation managers. Suppose we are interested in managing a site for bird watching. Through discussions with experts, user surveys, or focus groups we might discover that the following attributes are important to bird watchers:

- total number of observations (birds);
- number of different species;
- condition of the understory;
- presence of interpretive information on the site.

We assume that one's bird watching experience is affected by both the number and diversity of observations, the presence of interpretive information, and the condition of the understory. Aesthetics, visibility, and perhaps the number and diversity of birds in the area could be influenced by management of the understory. We also assume that our preliminary work indicates that the following categorical breakdowns are meaningful:

Birds	Species	Understory	Interpretive
0 to 10	2 or less	Open	No
11 to 20	3 to 5	Moderate	Yes
21 to 30	6 or more	Dense	
31 or more			

There are many ways to collect the needed data (e.g., interview, focus group, and mail survey). Sample cards might be prepared, each card depicting a specific bundle of attribute levels. Each bundle of attributes might represent the outcome of a particular management strategy. Respondents could be asked to choose between pairs of sample cards, rank the cards in order of preference, or assign numerical ratings to each card. Obviously, numerical ratings provide the most information but also place the greatest cognitive demands on respondents. The analyst must consider the overall situation carefully when selecting a sampling technique and choosing the combinations of attribute levels to include on the sample cards. Green (1974) provides information on experimental design in the context of conjoint analysis.

In this example we assume that respondents were asked to give each of 18 sample cards a numerical rating from 1 to 10. Figure 1 shows 3 of the 18 sample cards. Multiple regression using dummy variable coding generally is used to estimate the part-worth or partial utility functions, which may be depicted graphically as in Figure 2. The part-worth functions can be used to estimate ratings for any combination of attribute levels. This provides high leverage between the data actually collected (18 different combinations of attributes) and those for which estimates can be developed (72 possible combinations in this example).

Card A	Card B	Card C
Birds: 11 to 20	**Birds:** 11 to 20	**Birds:** 31 or More
Species: 2 or Less	**Species:** 6 or More	**Species:** 3-5
Understory: Moderate	**Understory:** Open	**Understory:** Dense
Interpretive: No	**Interpretive:** Yes	**Interpretive:** No
Rating:_____	**Rating:**_____	**Rating:**_____

Figure 1. Sample cards.

For illustrative purposes, the estimated rating values for sample cards A and B in Figure 1 are calculated using the part-worth functions depicted in Figure 2 (see next page).

Card A values		Card B values	
11 to 20 birds	= 1.2	11 to 20 birds	= 1.2
Less than 2 species	= 0.0	6 or more species	= 2.0
Moderate understory	= 1.3	Open understory	= 1.5
No interpretive signs	= 0.0	Interpretive signs	= 0.7
Total estimated rating	= 2.5	Total estimated rating	= 5.4

Similar calculations can be performed to estimate the rating (preference) for any combination of attributes. Marginal rates of substitution among attributes or the trade-offs respondents are willing to make also can be calculated under various scenarios.

Researchers or managers may want to study the relationships between preferences and demographic or other background information on respondents. This is done by creating a matrix of attribute part-worths and demographic or sociological variables by respondent. These estimated relationships may be useful in forecasting the effects of demographic trends on future preferences and in understanding the preferences of various user groups. These types of analyses are somewhat analogous to identification of market segments in studies of consumer preferences.

The example cited illustrates the use of conjoint techniques to analyze preferences for various ways to meet a single objective (bird watching). Managers frequently must decide how to allocate funds or land areas to meet multiple and often conflicting objectives. Scientifically based recommendations or expert opinion may provide guidance in determining how and what land to manage to meet specific objectives, but determining the relative importance of objectives rests on human values. Although the analyses are more complex, conjoint techniques can be used to estimate preferences among objectives (e.g., bird watching, developed recreation, various wildlife habitats, and timber management). Results of these analyses provide estimates of the costs or trade-offs in terms of other objectives implied by the choices of the sample respondents.

Conjoint techniques also provide a viable means for collecting and analyzing public input. Respondents may be asked to express their preferences with respect to specific objectives and land areas, or with respect to more general value or allocational decisions. For example, Opaluch et al. (1993) described an approach that used paired comparisons to rank potential noxious facility sites in terms of their social impacts. Conjoint analyses are particularly useful in providing respondents with feedback concerning the acceptable trade-offs and values that their choices imply.

Summary

Difficult choices, often involving conflicting uses, must be made by resource and recreation managers. Biophysical information and technical expertise alone is not sufficient for choosing among alternative management strategies. Human wants, needs, beliefs, and values must be considered. Conjoint techniques are well suited for estimating and analyzing human preferences and values. Marginal rates of substitution or the trade-offs people are willing to accept among competing uses can be estimated and used to facilitate decision-making. Estimates of partial utilities that are implied by the respondent's choices can be used to estimate the effectiveness of various management or land allocation strategies. Conjoint techniques also provide a mechanism for collecting input from stakeholders, as required on National Forests and many other public lands.

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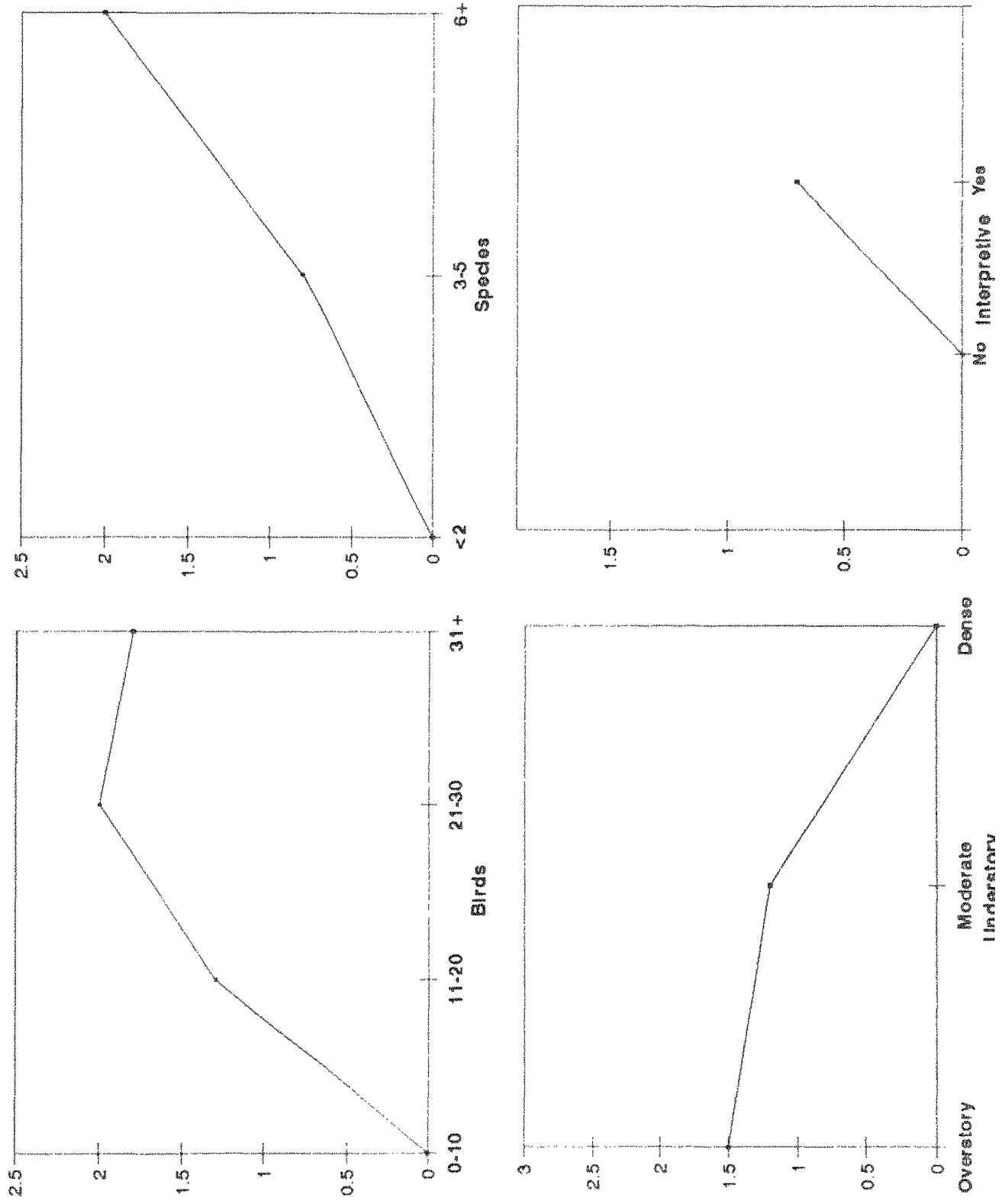


Figure 2. Part-worth functions.

THE INTEGRATED BUSINESS INFORMATION SYSTEM: USING AUTOMATION TO MONITOR COST-EFFECTIVENESS OF PARK OPERATIONS

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The cost-effectiveness of park operations is often neglected because information is laborious to compile. The information, however, is critical if we are to derive maximum benefit from scarce resources. This paper describes an automated system for calculating cost-effectiveness ratios with minimum effort using data from existing data bases.

Introduction

Parks Canada, like most other public agencies in North America, is faced with budgets that are shrinking. It is therefore becoming increasingly hard to meet client expectations or maintain standards that agency professionals consider adequate. Parks Canada's reaction to budget restraint has been to look for more "business-like" (or private sector-like) approaches to operating parks, with the idea that this will somehow solve the financial problems of a government operation.

The authors have heard "business-like" being described in Parks Canada in many ways. For example, business-like can mean that services which provide mainly a benefit for the user (e.g., camping), should be entirely paid for by user fees. Another characterization is that parks should generate revenue wherever they can to help finance their operations. In a simpler form, more business-like can simply mean costs have to be cut or levels of service must be lowered. These descriptions are often little more than counsels of virtue. They are not very concrete guides to action or rigorous criteria for decision making.

The authors believe that, if the concept of being "business-like" is to be useful in the facing severe financial restraint, it must be taken to mean "the concentrating of resources on those operations that are most cost-effective." Cost-effectiveness here is rigorously defined as the ratio of cost to the amount of effect or benefit produced by the expenditure. For example, if the agency considers the creation of a camping experience for one night to be an effect or benefit that the agency is mandated to produce, then the cost per party night of camping is a cost-effectiveness measure. This and similar measures can then be used to compare the performance of equivalent operations to determine which are more cost-effective and which less so. Then the agency can concentrate its resources on the most cost-effective operations. This, the authors contend, would be the business-like way to live within any budget constraints. Concentrating resources on the most cost-effective activities, and thus maximizing cost-effectiveness, of course, is exactly equivalent to the private firm's profit maximizing behaviour.

The approach raises problems, of course, not the least of which is how to measure the myriad of effects or benefits, often ephemeral, of the many products which an outdoor recreation agency produces (for an example of some of the complexity, see Stanley, Beaman, Teskey, 1993). These problems have by no means been solved. But as a general approach, it appears more fruitful than repeating truisms like "We must cut costs."

The particular problem which the authors attack in this paper is the one of where and how to get the information necessary for the cost-effectiveness measures which we believe managers need. Currently, in Parks Canada, the principal management information system, the financial system, only provides the manager with information on how much his budget is, how much he had spent so far in the budget year, and what was left. In other words, it only reports costs. To operate the park as a business, the manager must now also have information on benefits, to compare to costs. These benefits can be revenue, or they can be other kinds of measures such as number of people served, or amount of resources protected, but they somehow must be measured.

Table 1 shows a hypothetical example of the kind of information that is currently available to a park manager.

Table 1. Campground costs (hypothetical).

(1) Campground	(2) Costs ($)
Campground 1	320,500
Campground 2	571,600
Campground 3	290,300

We can see that campground 2 is the most expensive. We can see that campground 3 is cheapest. But does this mean that campground three is more efficient? It could merely be smaller. Campground 1 is cheaper than campground 2, but if campground 1 is always empty and 2 full, then expenditure on 2 is in some way better. There is very little we can conclude from the data in Table 1. Managers can probably come to conclusions of some sort since they have a great deal of informal (usually unquantified) knowledge about size (it's big), occupancy (it's crowded), efficiency (it's well run), and so forth. This informal information, however, is rarely used in connection with the financial information to draw any conclusions about campground operations. Furthermore, qualitative or categorical information about the size or popularity of campground 1 compared to campground 2 does not allow anyone to compare the cost-effectiveness.

If we add quantitative effect data, we can increase the value of the information in Table 1 enormously. This is done in Table 2, where we add party night data and then use the two pieces of data to calculate a simple cost-effectiveness measure: cost per party night.

Table 2. Campground costs (hypothetical), with party-night use and cost per party-night included.

(1) Campground	(2) Costs ($)	(3) Party-nights of Use	(4) Cost per Party-night ($)
Campground 1	320,500	15260	21
Campground 2	571,600	15448	37
Campground 3	290,300	5692	51

With the addition of use data, comparison between campgrounds suddenly becomes possible. We can now see that Campground 1 is the most cost-effective, providing a party-night of camping for $21, compared to campground 3, where it costs $51 (recall that campground 3 appeared to be the least expensive campground in Table 1). A manager can now see how much must be charged if the campground is to become self-financing. If it cannot be self-financing, the manager at least sees the amount of subsidy which

must be given to each party night of camping, and can start to consider whether such a subsidy level is justified. Managers now know where to look for examples of cost-effective practice which might be useful to emulate. Senior managers, examining this data, would know where to start to look for inefficiencies. In other words, with a combination of cost and effect data, we can begin to ask business questions.

Of course, campground operations are much more complicated than this. One explanation for the higher or lower costs might be the quality of service in the campground. Another might be difficult operating conditions (for example, the $51 per party-night campground may be in the high Arctic). Specialised knowledge of situations, or further data, is necessary to properly interpret the data and ratios of Table 2 and not be misled by them. However, the use of even the simplest effect data starts to promote thinking about the business issues involved in the camping operations and how to maximize cost-effectiveness.

Operational Reviews: Managers Realize the Need for Information

One of the first steps Parks Canada took to adopt a more "business-like" approach was to conduct a series of operational reviews of various park services in 1992 and 1993. An operational review is a one time, in-depth study of the costs and benefits of providing a given service across the parks system. Its aim is to find efficiencies and ways to increase the benefits relative to the costs for a given service. Operational reviews were done of campgrounds, highways, heritage canals, staff housing, among many other services. Each of these reviews required a significant effort to collect data on cost and use, on actual and potential markets, on client satisfaction and on level of service offered (in other words, on effects). Each operational review was conducted by a specially designated task force, who took on the task in addition to their regular duties.

When managers in Parks Canada's Atlantic Region conducted their campground operational review (Horne and Stewart 1994), and saw cost data used in conjunction with effect data, they recognized the value of this information. They also realised that they needed this information regularly if they were to properly manage their operations. It was too valuable to just collect it once and then forget about it. Unfortunately, they also saw that the information was cumbersome and inefficient to collect and analyze.

The operational reviews conducted in the Atlantic Region consumed an immense amount of resources. Compiling the financial, use and investment data, recoding the data and formatting the output for these reviews required six months of time and involved several individuals, some of whom worked full-time on the effort. Utilizing spreadsheets as the analysis tool, resulted in difficulties in updating data, and correcting errors, as approximately 1,000 spreadsheets were created, a volume that is simply unmanageable. Clearly, it was not feasible to do this as part of the regular annual management cycle of activities.

Managers in the regional office therefore asked the authors of this paper to develop an automated solution whereby they could easily get the business information they needed from existing data sources, without the resort to the laborious methods previously used. The Integrated Business Information System was the result.

Integrated Business Information System (IBIS)

The first question to answer then was: the cost-effectiveness of what? The Parks Canada financial system contained data on expenditures listed by organizational unit. The asset data base contained information on condition and location of assets. The use data system contained data on volumes of use for assets and sometimes at events, but did not have information on organizational units or money.

The one element that all this data appeared to have in common was the "product" or service that the client received. (e.g., camping). Organizations spent money to provide products to the user (the Visitor Services unit incurred costs to provide a campsite). Capital assets often must exist for a product to be produced (a campsite must be built in order for camping to take place, a road must exist to give them access). Users consume products (campers camps and are counted when they do so). Finally, users express satisfaction with the experience of consuming the product (campers enjoy camping). We therefore chose the product as the unifying element, and defined a set of products that exhausted what a park spends its budget on.

With a unifying element defined, it was now possible to construct a data model. A data model is a concept of how data relate to each other and a set of rules for determining which records in which data bases belong together and so can be joined. For example, the rules tell us that any cost bearing a certain code in one data base relates to any use bearing a certain but totally different code in a different data base, and that both of these relate to the name of a product which bears yet a third code in a third data base. These rules allowed us to combine data from the cost and effect data bases in order to calculate cost-effectiveness ratios.

The concept and rules, of course, had to be implemented in a software which would actually link the data and perform the necessary calculations and print the reports. There were difficulties here. None of the data sources were designed with the intent of combining their data with another data source to do calculations. Therefore, the data were not always categorized or coded the same way. The financial system collects data to ensure a manager does not spend more money than is allocated, so it is categorized by organization, not necessarily by what the manager's product is. Extra coding had to be added, and managers had code their expenses to somewhat modified categories. The asset database is used to estimate the amount of money required for the upkeep of our assets. Which assets relate to which products had to be imputed, especially where an asset served to produce several products simultaneously (e.g., a general purpose information centre, theatre and administration building). The visitor use database stores data on the consumption of park services. Even though the same type of asset or activity took place in most parks, each park could have its own code for it, even in the national, common data base. Finally, the coding often changed from year to year within the same data base and park.

A great deal of effort was therefore expended to cross reference codes that represent the same thing and to generate common codes or correspondences. Tables of information had to be created to map these relationships among codings. As well, data often had to be manipulated so that it could be made to refer to a product being consumed by a client. The result, the working data model, is the first part of IBIS (see Figure 1).

The second part of IBIS is the analysis and report engine. Once the data has been integrated, the only thing that remains is to decide which data should be combined with which other data, and what ratios to be calculated. Table 2 above illustrates the kind of output which is produced by the report engine. Records from two or more different sources, each referring to the identical product, are combined, and a ratio is calculated. The calculation and report generation are standard functions of any data base language , and were easily implemented in Microsoft Access (Microsoft, 1993), which is the particular data base software the authors used.

The advantages of IBIS over the one-off Operational Reviews was immediately apparent to managers in the Atlantic region. Once IBIS was established in a park, the analysis of cost-effectiveness could be done repeatedly without laborious spreadsheet analysis and data collection. IBIS of course uses existing data that is being collected anyway as part of other operations.

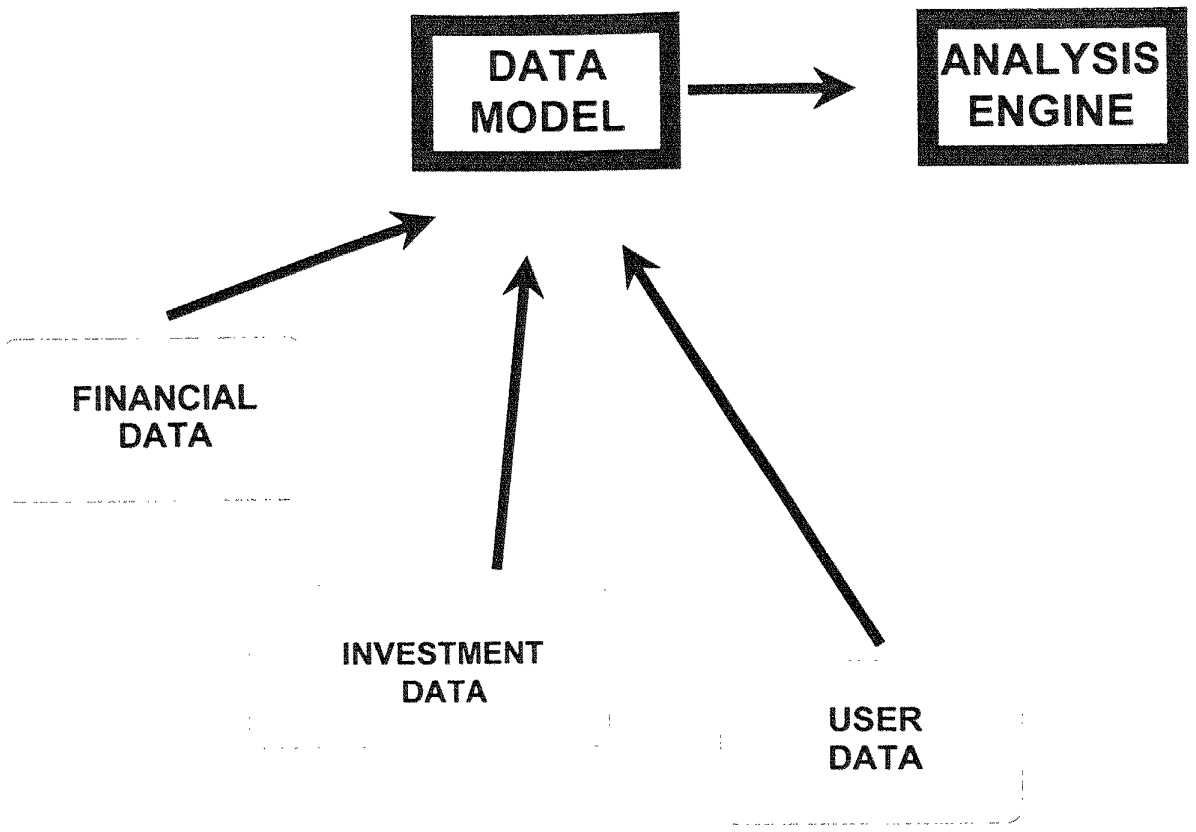


Figure 1. Parts of IBIS. Data model combines data from several data sources, and analysis engine does pre-defined calculations and produces report.

IBIS was developed as a database, while the Atlantic Region's operational reviews utilized spreadsheets. Why was this? Trade-offs are involved in selecting the "right" tool for any analysis. An approach using spreadsheets is easier to initiate and may be less intimating to the analyst. There is less conceptual overhead in identifying the relationships among the data as the user enters the values directly in spreadsheet cells, rather than in related normalized tables (For a discussion see: Beaman and Grimm 1989, Avedon 1991). This approach is very tedious, labour intensive and very time consuming. As a result it is difficult, if not impossible, for a manager to have "instantaneous" information. Updating the analysis is equally laborious: even though the spreadsheet is set up, to update the analysis, data must once again be manually entered in the spreadsheet cells.

Using a database as the analysis engine provides a method that allows instantaneous updating to be available to the manager. Databases, of course, come with their own overhead. They must be carefully designed, so that the tables used to store data do not contain redundant information. Furthermore, the tables must be designed so that "natural" relationships among the data are represented, and a user interface must be developed to allow easy access to the information. Once the database is designed and developed however, the manager has instant access to new information. The database can extract data from other sources and generate the reports, eliminating the need for manual recoding of data. As a consequence, any time the original data changes (for example, when new financial data is recorded in the financial system), a new report can be produced automatically.

To compare the two methods for analysis, estimates were drawn up to highlight the differences in time taken for various tasks in the analysis and tool development for both approaches and the time needed to complete subsequent analysis for future years (see Table 3).

Table 3: Comparison of time taken on analysis tasks for alternative approaches.

Task	Spreadsheet	Database
Time to Learn Financial System	0 months	2 months
Time Take to Complete Development	6 months	7 months
Estimated Time for Repeat Analysis	3-4 months	1-2 days

While development time is comparable, time to repeat analyses once the original report is set up is significantly lower with IBIS. This enables IBIS to be used regularly in the planning and resource allocation cycle.

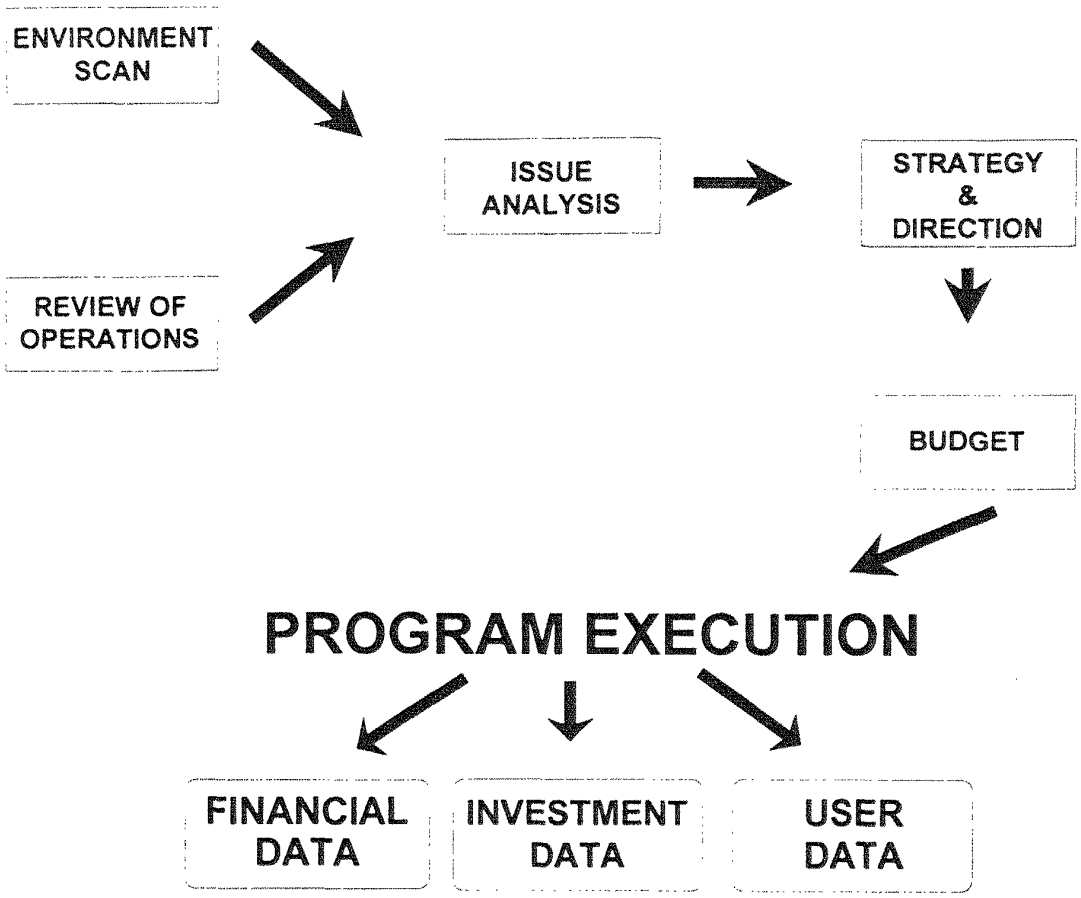


Figure 2. A typical resource planning and budgeting cycle.

How IBIS is used

Figure 2 illustrates a typical resource planning and budgeting cycle of the kind that could be used at any level in Parks Canada. The terminology and the exact steps will vary from place to place. Nor are all the stages are necessarily carried out every organization every time. It is, however, essentially the cycle that can be found in many complex organizations. The cycle starts with the **environmental scan**, an examination of the circumstances in which the organization finds itself. The environmental scan looks outside the organization to see what issues are impacting it, and what problems it will face. These could be anything from the fiscal climate to changes in market behaviour.

The **review of operations** is an examination of performance, efficiency, and cost-effectiveness within the organization. This is the stage at which the operational reviews mentioned above took place. Reviews of operations, when they happen at all, typically are major, one-time studies which are done by a specially assembled task force which spends a great deal of time and energy collecting operational data (see Table 3) and using its collective experience to interpret it. Once the review is finished, the task force typically disbands with great relief.

The combination of the information obtained at these stages leads to the identification of the key issues or problems (**issue analysis**) which the agency has to deal with, and an analysis of the options available to the agency to resolve the issues. The chosen options are set out as a strategy and sent out as instructions to the operating parts of the agency (**strategy and direction**), and resources necessary to carry out the instructions are allocated in a **budget**. The agency can then proceed to execute the program.

Something, however, is missing in the picture in Figure 2. The planning cycle loop is not closed. If we want to go through the complete cycle again, we must once again call together a task force to review the operations, as laboriously as before, something an organization is loath to do too often. This is why organizations often plan and allocate resources without going through all the steps.

Figure 3 illustrates that something important is, nevertheless, happening during program execution. A variety of information is being generated about program execution: its costs, the future investment needs it is creating, the use the program and its services and products are receiving, and a variety of other information. Some of this is being captured in automated systems.

This is where IBIS enters to complete the loop. Figure 4 illustrates that IBIS serves to scoop up the information that is being generated as a by-product of program execution, analyze it, and provide the reports for the review of operations. It is doing much of the work of the weary task force, and it is doing it automatically. It enables the planning cycle to be done frequently and be updated continually. IBIS provides the feedback on how well the strategy and direction has been achieved, as well as giving an indication of issues to be faced in the future.

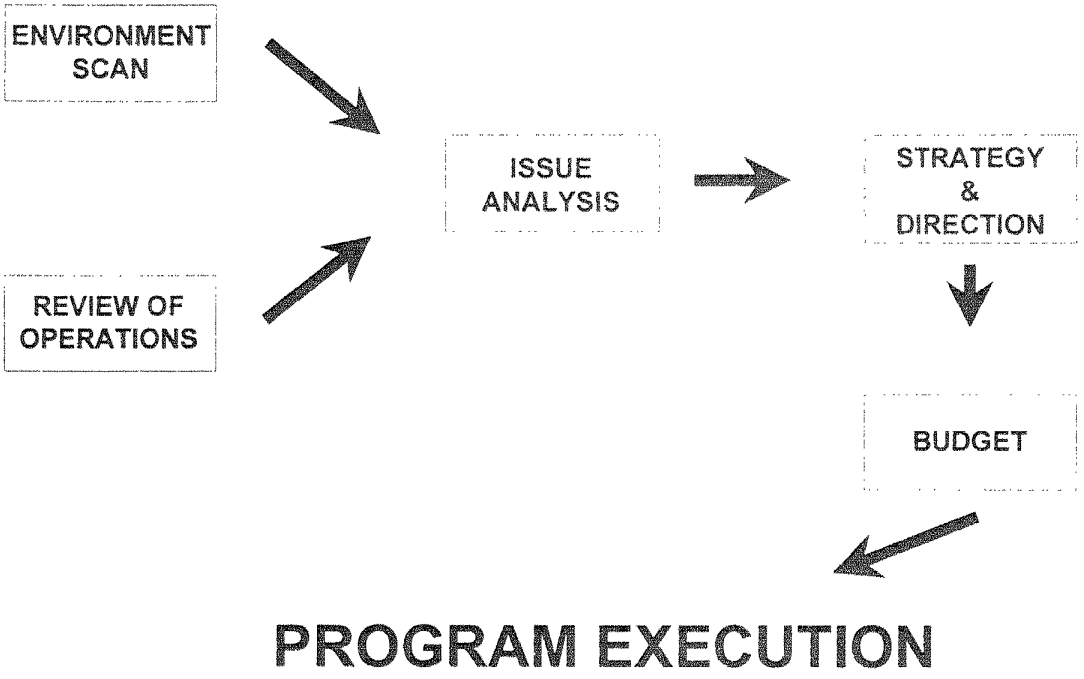


Figure 3. Program execution results in a variety of data being generated about the program.

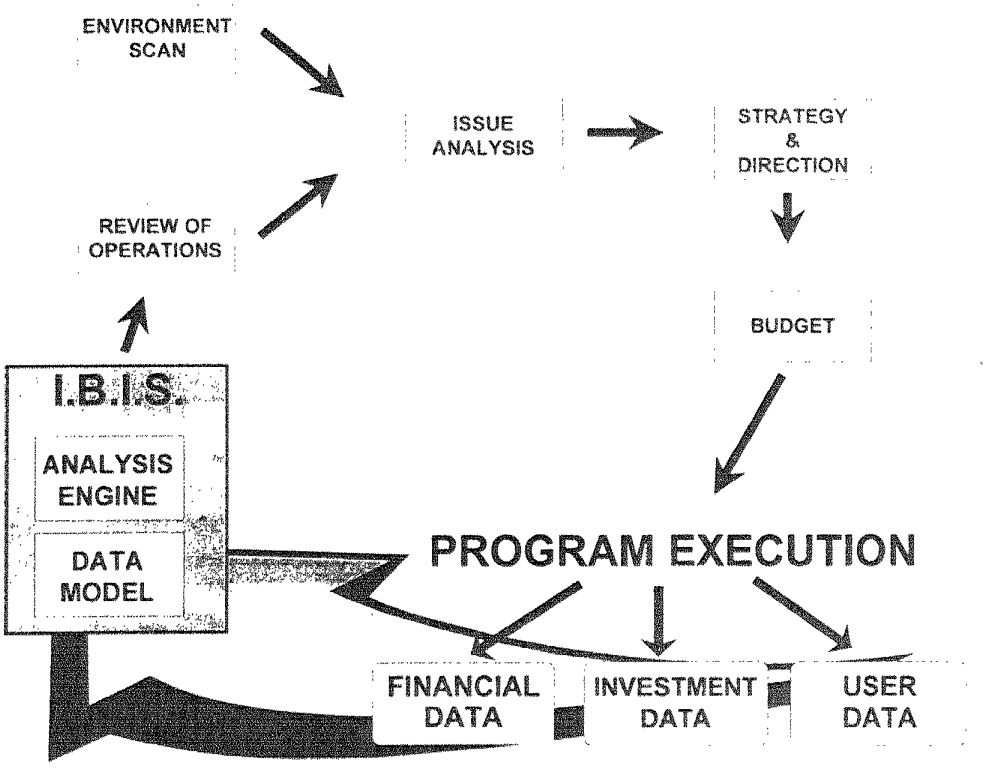


Figure 4. IBIS closes the loop and makes continual monitoring of program execution, and regular strategic planning feasible.

A "Hypothetical" Example

Table 4 shows a report from IBIS. Most of the data is drawn from the IBIS prototype application running in Parks Canada's Atlantic region. It is "hypothetical" only in that the numbers of day-users is estimated, based on weak assumptions, and the fee charged is purely speculative. No fee is currently charged for day use, and there are at this time no definite plans for such a fee.

There is a variety of information which a manager can derive from Table 4. Cape Breton Highlands, Kejimkujik and Terra Nova are all recovering their costs. Terra Nova is not as profitable as the other two parks, but weather is very harsh in Newfoundland, and discouraging to day-use, so being able to recover costs at all is probably an excellent achievement. Both Kouchibouguac and Prince Edward Island are operating at a loss. However, both these parks provide well equipped (and so expensive to maintain) beaches as part of their day use areas. The results might lead managers to consider the feasibility of charging higher fees for this extra service, thus making the areas profitable. Gros Morne profit per user-day is way out of line with the rest of the parks. This may be a place which needs special examination (or the data from the prototype is erroneous. The authors did not in fact verify the data for the prototype runs; however, even if it is erroneous, it is useful for the purpose of the example.)

Table 4. Analysis of the costs of day-use activity.

(1) Park	(2) Annual Costs ($000)	(3) Cost per User -day ($)	(4) Fee Charged ($)	(5) Profit (Loss) per User-day ($)
Cape Breton Highlands	331	1.16	2.00	0.84
Gros Morne	365	8.88	2.00	(6.88)
Kejimkujik	116	1.28	2.00	0.72
Kouchibouguac	218	3.16	2.00	(1.16)
Prince Edward Island	826	3.80	2.00	(1.80)
Terra Nova	139	1.64	2.00	0.36

Let us assume, for purposes of our example, that we have checked our data and the huge loss experienced by Gros Morne is true and not just a data error. Let us further assume that examination of the situation by experts and managers has revealed that the high cost is due to the fact that Gros Morne dayuse areas are brand new and very few visitors are yet aware of them. Therefore the costs may be reasonable in the short run, since the day use areas have not yet experienced the levels of use for which they were designed, but can be expected to in the near future. A good management strategy under these circumstances might be to determine what is a reasonable time period to wait for a profit to be realized. If past experience indicates that it takes about five years for a day use area to reach its full use potential (presumably, this would have been known when the area was built), then a reasonable profit trajectory can be built. Columns one and two of Table 5 shows such a trajectory. Managers can agree on this projection as a reasonable one, which, if it is realized, would cause no management concern.

Table 5. Comparison of expected and actual profits over five years.

(1) Year	(2) Expected Profit [management anticipation]	(3) Actual Profit [from IBIS]
1996	(6.00)	(6.88)
1997	(5.00)	(6.42)
1998	(3.00)	(5.75)
1999	(1.00)	(5.50)
2000	0.30	(5.57)

Up to column 2, the information to identify the problem could equally well have been produced by the task force as by IBIS. No task force or IBIS would be needed to produce the management strategy, just the analysis by the dayuse area manager, his superiors or subject matter experts.

Table 5 however also shows in column 3 what actually happened (hypothetically, of course). Here we can see that the losses stayed high. The number if visitors did not materialize in the time foreseen. Perhaps the original planning for construction was at fault. Perhaps other strategies such as promotion should have been tried. Whatever the case, the table clearly indicates there continues to be a problem, and that the original strategy is not working.

It is the third column in this table, which shows the results of five years of monitoring the strategy for Gros Morne day use areas, that is very hard for the manager or the long suffering task force to produce, and very easy to produce using IBIS. The difficulty of producing this column is why it is so rarely seen. Without this column, the problem at the park goes unrecognized, or at least can be conveniently hidden by the manager. With the column, management attention is focused on the problem, so it can be resolved, and the ineffective use of public money can be eliminated.

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Demographics



GENDER DIFFERENCES IN THE USE OF PUBLIC PARKS IN NORTHEAST OHIO

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Data from an in-park survey and a telephone survey were used to examine differences between men and women in their use of public parks in Northeast Ohio. Analysis of the surveys revealed that there were fundamental differences in the way men and women use parks, and the kinds of barriers that limited their use of parks.

Introduction and Purpose of the Study

The last 15years has witnessed a growing interest in gender issues as they relate to leisure and recreation behavior. Men and women have been found to differ in the meanings and definitions they assign to leisure (Iso-Ahola 1979; Kleiber & Crandall 1981; Henderson 1990), the amount of free time they have (Shaw 1985), the satisfaction they derive from leisure (Riddick 1985), the motives they have for leisure (Hirschman 1984), the benefits obtained from leisure (Tinsley et al , 1987), the continuity of leisure participation across time (Scott and Willit, 1989), and their rate of participation in different activities (Kelly 1980; Unkel 1981; Dargitz 1988).

Despite increased interest in gender issues, there is a dearth of research that deals specifically with whether men and women differ in their use of public parks in or near urban areas. Without such information, park managers and recreation leaders will be unable to provide services that cater to the special needs of both men and women. The purpose of this paper was to determine whether men and women differed in their use of public parks in Northeast Ohio.

Study Area & Methodology

Data for this paper come from two sources: (a) an in-park survey conducted at 12 Cleveland Metroparks reservations, and (b) a telephone survey conducted of residents of seven Northeast Ohio counties.

The in-park survey was conducted within Cleveland Metroparks, a regional park district in Northeast Ohio. Cleveland Metroparks consists of over 19,000 acres of land in 12 different reservations (parks). Facilities and features operated by the Park District include hiking, bridle, all purpose and fitness trails, golf courses, swimming beaches, nature centers, interpretive programs, picnic areas, play fields, wildlife sanctuaries, and boating and fishing areas.

Approximately 5,000 people were interviewed during the spring, summer, and fall of 1991 by trained interviewers. Interviews were conducted on random weekdays and weekends. Visitors were interviewed using a random selection process. Respondents were asked about the kinds of activities they pursued during their visit, how often they visited, how long they planned to visit, their mode of travel, how long it took them to travel to the reservation, the number of people and children in their party, their use of other Park District reservations, their attitudes toward recreational development, and their ratings of Park District facilities and services. Demographic characteristics of respondents were also acquired.

Data for the second study were drawn in October, 1991. Using random digit dialing, 1,054 people in Northeast Ohio were interviewed about their use of public parks in the greater Cleveland Metropolitan area. Only people 18 years and older were interviewed. Respondents were asked how frequently they used public parks in Northeast Ohio. Non-users and infrequent users (individuals who used parks less than once a month) were asked questions about why they did not use public parks more often, and questions about whether different changes in park operations might result in their using parks more.

Chi-square tests were used to test whether women and men differed significantly in terms of their use of Cleveland Metroparks and parks in general.

Results: In-Park Survey

Rates of Cleveland Metroparks Visitation

A greater proportion of Cleveland Metroparks visitors are male (55%) than female (45%). While this difference may seem small, it is notable since women outnumber men in the region by about 6%. There was little variation in this general pattern by day of the week, time of day, and season of the year (Table 1). However, differences in visitation rates between the sexes increase dramatically with age. Only 36% of visitors between the ages of 65 to 74 were female; further, only 28% of visitors 75 years of age or older were female.

Table 1. Percentage of Park District visitors who are male and female - by temporal patterns.

		Women	Men	Chi-Square
Day of the Week				
Weekday	%	44.2	55.8	
Weekend	%	47.5	52.5	4.94*
Time of Day				
Morning	%	43.9	56.1	
Afternoon	%	46.6	53.4	
Evening	%	46.0	54.0	2.69
Season of the Year				
Spring	%	44.9	55.1	
Summer	%	46.6	53.4	
Fall	%	44.0	56.0	2.40

* $p \leq .05$

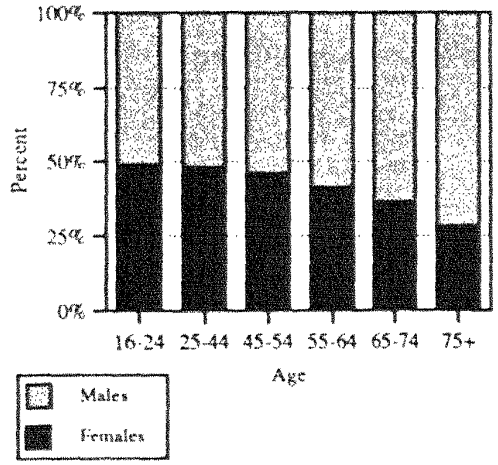


Figure 1. Sex by age differences in the use of Cleveland Metroparks.

General Patterns of Visitation

Men and women differed little in terms of how far away they live from a Park District reservation, mode of transportation to the reservation, and how long they stay while visiting (Table 1). In contrast, men and women differed significantly in terms of frequency of visitation, the number of children (under 14 years of age) accompanied by them, and the number of other Park District reservations they have visited in the last 12 months.

Men were more likely to be frequent visitors of the reservation they were visiting. If we define a regular visitor as someone who visits at least once a month, we observe that 66% of men fell in this category, compared to 56% of women.

Women are far more likely than men to visit in the company of small children. Nearly four out of ten women said they visited the reservation in the company of at least one child under 14 years of age. Only 22% of men said they were accompanied by at least one child. Women were more than twice as likely as men to visit with three or more children (15% to 7%).

Men were somewhat more likely than women to visit more Park District reservation in the last 12 months. Thirty-one percent of men said they had visited three or more other reservations, compared to 26% of women.

Table 2. General patterns of visitation at Cleveland Metroparks - by gender.

	Women %	Men %	Chi Square
Travel time to reservation			
Less than 15 minutes	58.4	60.1	
15-30 minutes	32.8	30.4	
More than 30 minutes	8.8	9.4	3.19
Frequency of visitation			
First-time visitor	12.8	9.1	
Less than once a month	31.1	25.3	
Once a month	12.9	14.0	
Once a week	20.5	23.6	
Almost daily	22.8	28.1	49.81***
Duration of visit			
Less than 1 hour	33.5	35.8	
1-2 hours	38.2	37.1	
2-3 hours	12.7	13.2	
2 hours or more	15.6	14.0	4.33
Mode of transportation			
Foot or bicycle	6.4	7.0	
Car or van	92.3	91.0	
Other	1.2	2.1	5.45
Number of children in group under 14 years of age			
Zero	61.9	78.0	
One or two	23.1	15.4	
Three or more	15.0	6.6	164.10***
Other Park District areas visited during the last 12 months			
Zero	30.9	28.5	
One or two	43.2	40.9	
Three or more	25.8	30.6	12.71***
Number of activities participated in during visit			
One	31.7	42.6	
Two	24.9	27.3	
Three	20.4	14.7	
Four or more	23.0	15.4	99.60***

*** $p \leq .001$

Activity Patterns

Table 3 provides a rank ordering of participation rates for different activities pursued in Cleveland Metroparks. While the rank orderings are quite similar for men and women, there were, nevertheless, significant differences in participation rates between the sexes. Walking/hiking and picnicking were the most widely pursued activities in Cleveland Metroparks among both women and men. However, women reported participating in both of these activities at higher rates than men. About half of all women said they walked or hiked, compared to 40% of men. One quarter of women reported picnicking compared to 16% of men. Significantly higher rates of participation were also reported among women in activities such as observing nature (14% to 11%), swimming (10% to 5%), and visiting a nature center (7% to 4%). In contrast, men reported participating in significantly higher rates in activities such as running/jogging (7% to 4%), bicycling (6% to 4%) and golf (4% to 2%).

Men and women differed not only in their rate of participation in different activities, but also in the number of activities they pursued during their visit (Table 2). In general, women reported participating in more activities during their visit than men. Fortythree percent of all men said they participated in only one activity during their visit, compared to only 32% of women.

Table 3. Rate of activity participation - by gender. [a]

	Women %	Men %	Chi Square
Walking/hiking	49.0	39.3	46.35***
Picnicking	25.2	15.8	66.01***
Play with children	16.7	7.1	108.03***
Observe nature	13.6	11.3	6.23**
Swimming	9.7	5.4	33.87***
Visit a nature center	7.2	4.4	16.52***
Fishing	4.7	9.5	42.06***
Running/jogging	4.2	7.4	21.58***
Bicycling	3.6	5.9	13.66***
Golf	1.8	4.1	20.79***

[a] Percentages includes those who said they participated in activity on day of interview.

** $p \leq .01$; *** $p \leq .001$

Results: Telephone Survey

Use of Parks in Northeast Ohio

Respondents to the telephone survey were asked how frequently they used parks in Northeast Ohio. A breakdown of responsesby--gender--is provided in Table 4. Women were far more likely than men to be nonusers of parks in Northeast Ohio. More than 30% of women said they did not use parks, compared to 22% of men. Men, in contrast, were more likely to be regular users of parks, defined here as using parks at least once a month. Forty-seven percent of men said they use parks at least once a month, compared to 34% of women.

Table 4. Frequency of park visitation in Northeast Ohio - by gender.

	Women %	Men %	Chi-Square
Never	30.7	22.2	
1-2 times per year	22.5	22.0	
Less than once a month	12.5	8.3	
Once a month	22.8	28.8	
Once a week or more	11.4	18.7	23.95***

*** $p \leq .001$

Barriers to Park Visitation

A rank ordering of different constraints to park visitation--broken down by gender--is provided in Table 5. The percentages correspond to that fraction of nonusers and infrequent users who said a factor was very important in limiting their use of public parks in Northeast Ohio. While men and women differed significantly in the kinds of barriers they said that limited their use of parks, the rank orderings of these barriers was similar for both.

Table 5. Factors that limit people's use of public parks in Northeast Ohio - by gender. [a]

	Women %	Men %	Chi Square
Lack of time46.8	41.3	1.65	
Busy with other activities	40.6	41.4	0.04
Fear of crime39.9	24.1	15.82***	
Busy with family	39.2	26.7	9.95**
Pursue recreation elsewhere	26.0	25.6	0.12
Lack of information	20.2	24.9	1.79
No one with whom to go	20.0	6.3	21.11***
Parks are too far away	14.8	9.5	3.47
No way to get to parks	14.0	5.9	9.63**
Lack public transp. to parks	13.1	5.4	9.02**
Cost too much	7.7	2.8	5.72*

[a] Percentages include individuals who said factor was very important in limiting their use of public parks.
* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Lack of time and being busy with other activities were the most important constraints cited by both women and men as limiting their use of parks. Over 40% of both women and men said these constraints were very important barriers to greater park use.

Fear of crime and family responsibilities were also cited by large numbers of both women and men, although more so for women than men. Four out of ten women said their use of parks was greatly limited by fear of crime or being too busy with family responsibilities. Only one-quarter of men said these constraints were very important in limiting their use of parks.

One-quarter of both women and men said they pursued recreation elsewhere. A large fraction of both women (20%) and men (25%) also said they lacked information about existing parks and park programs.

Significantly more women said lack of companionship was a very important barrier to park use. Twenty percent of women said they did not use parks more often because they did not have any one with whom to go. Only 6% of men cited this as a reason for not using parks more often.

Other constraints figured less prominently in limiting both men and women' use of parks. However, even among these items there were significant differences between the sexes. In particular, accessibility was more often cited as a problem by women than men. Fourteen percent of women said not having any way to get to parks was a very important barrier to greater park use, compared to only 6% of men. Thirteen percent of women said they lacked public transportation, compared to only 5% of men.

The effects of gender were found to interact with age in their effect on two of the constraints items: fear of crime (Figure 2) and lack of companionship (Figure 3). The importance of these constraints increased significantly with age for women, but remained relatively constant across the life span among men.

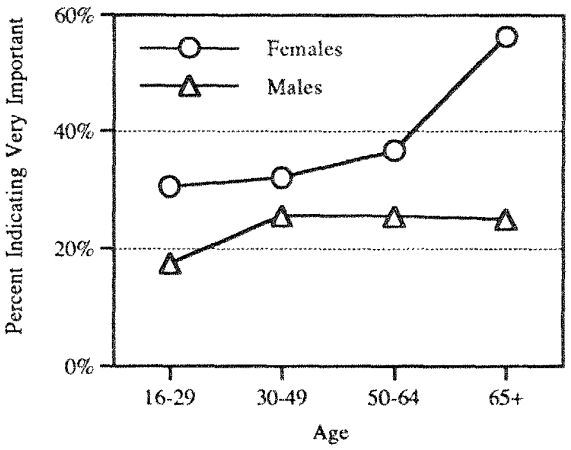


Figure 2. Percent citing fear of crime as a very important barrier to use of public parks - by gender and age.

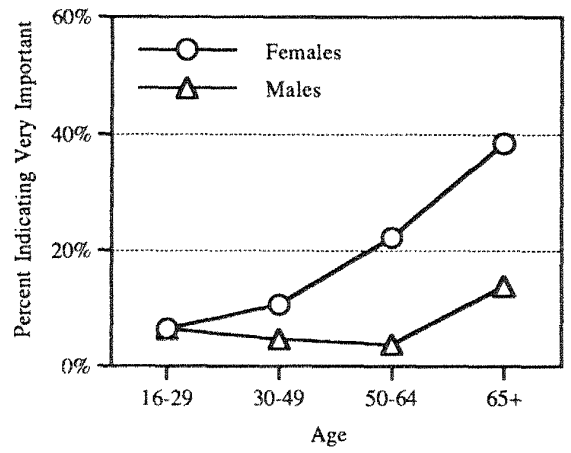


Figure 3. Percent citing lack of companionship as a very important barrier to use of public parks - by gender and age.

Conclusions and Implications

Men and women differed markedly in their use of Cleveland Metroparks and the factors contributing to non-use of parks in general. Data presented here raise a number of research questions and issues for individuals involved in the delivery of park services in Northeast Ohio.

a. Managers and park employees historically have looked at their services in terms of a "field of dreams" mentality: "If you build it they will come!" Frequently visitors do come but, as these data indicate, park visitors who do come tend to be disproportionately male. Moreover, differences in visitation rates between the sexes increase with age, with older men visiting at a far higher rate than older women. These results suggest that managers must tear away at some of their taken-for-granted understandings and seek to discern what role gender plays in people's use of public parks.

b. To a large extent, the way men and women use parks mirror their roles in everyday life. Women were much more likely than men to visit in the company of children. As a result, women were more likely to engage in activities that can be described as other-directed or, more simply, family-oriented. As evidence, we observed women reporting higher rates of picnicking and playing with children. Women also reported participating in higher rates of swimming and visiting a nature center--activities typically done within a family context. Men, in contrast, were more likely to engage in self-directed activities (fishing, golf, running or jogging). These differences in park visitation styles resemble styles of camping identified by Burch (1965) nearly 30 years ago. He pointed out that when men and women go camping together, their respective activities tended to reflect a traditional division of labor, with men engaging in "dramatic roles" and women engaging in more ordinary or practical ones.

c. Given the fact that men and women have distinct styles of park visitation, we may need to reexamine some of our theories and ideas about outdoor recreation behavior. Much of what we know about recreation specialization, for example, may be based on the experiences of men rather than women. Indeed, it could be that specialization occurs more among men than women. This study does provide some evidence for this, as men pursued significantly fewer activities during their visit than women. More systematic research is needed to test this proposition, however, and to test whether other theories (e.g., crowding) are gender neutral or gender specific.

d. Women's use of parks becomes increasingly problematic with age. This appears to be linked to a greater need for safety among women. While women were more likely than men to say they did not use parks because of fear of crime and not having anyone to go with, these tendencies increased dramatically among women as they aged. To better serve an older female population, park districts must be sensitive to their interests and their need to pursue such interests in a safe environment. Special programming, such as walking clubs, may help solve this problem. Programs such as these provide a safe and supportive social context for pursuing such activities.

e. Given that the data presented here are cross-sectional, we simply can not generalize findings to future generations of men and women. Only longitudinal data can do this. Moreover, these data do not consider the vast variability among men, on the one hand, and women, on the other (cf. Henderson, et al. 1989). Future research must explore this variability. One such example may be exploring differences in park visitation among African-American women, Hispanic women, and white women. Differences in park use among these three groups may also be explored in terms of age or life-cycle considerations.

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EXAMINING AFRICAN AMERICAN AND WHITE OUTDOOR RECREATION PARTICIPATION AFTER DEMOGRAPHIC STANDARDIZATION ON SELECTED CHARACTERISTICS

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The "marginality" explanation of differences between the outdoor recreation participation of African Americans and Whites was evaluated using demographic standardization of age, income, and education for a sample of African American and White Illinois residents. After standardization, African American/White differences in outdoor recreation participation were reduced in 12 out of 26 outdoor recreation activities and in the total days of participation across all activities. The results offer limited support for the marginality explanation.

African American and White Participation and the "Marginality Hypothesis"

The differences between White and African American outdoor recreation participation are well documented (Washburne 1978; Edwards 1981; Dwyer and Hutchinson 1990; Nadkarni and O'Leary 1992; Dwyer 1993b, 1994a). Most results are consistent with the conclusions from a recent analysis of participation by Illinois residents that African Americans are more likely than Whites to participate in sports; but less likely to participate in activities that take place in more remote areas and involve undeveloped settings or water/snow/ice (Dwyer 1993b).

An explanation for the differences in participation in outdoor recreation activities between African Americans and Whites is less well developed and agreed upon. Two explanations have been offered. The "ethnicity" explanation argues that the different participation patterns are attributable to different subcultures. "Marginality," on the other hand, argues that differences in recreation participation are attributable to socioeconomic differences (Washburne 1978). Research has yet to provide a clear understanding of the relative importance of these two explanations for differences in outdoor recreation participation (Wendling 1981; Hutchison 1988; Dwyer and Hutchison 1990).

If the marginality hypothesis is correct, then if two ethnic groups had the same socioeconomic characteristics, the differences between them would be eliminated or reduced if all other things are equal. Such an evaluation is done based on an analysis of data from a survey of the 1989 outdoor recreation participation patterns of Illinois residents.

Data Collection and Demographic Standardization

The data used in this study are from a random telephone sample of 1,000 Illinois residents age 18 and above. Data were collected by the Survey Research Laboratory at the University of Illinois at Champaign-Urbana for the Illinois Department of Conservation. There were 759 responses with sufficient data to be used including:

1. the number of days of participation in 26 recreation activities during the previous 12 months; and
2. their age, education, and income levels.

The 26 activities are shown in Table 1 along with the average days of participation for African Americans and Whites for each activity. Also shown is the sum of days over all activities.

Table 1. Effects of standardization on African American recreation behavior, 1989.

Activity	Mean Days White	Mean Days African American	Mean Days African American Standardized	African American-White Differences Not Standardized	African American-White Differences Standardized
Baseball	4.5258	4.2525	7.7021	0.2732	-3.1763
Backpacking	0.2197	0.0303	0.0604	0.1894	0.1592
Basketball	3.2394	5.6566	-6.5183	-2.4172	9.7577
Biking	12.5758	13.0809	2.8022	-0.5051	9.7736
Boating	3.2939	0.2525	0.2508	3.0414	3.0431
Canoeing	0.4258	0.0404	-0.0604	0.3854	0.4861
Downhill Skiing	0.2045	0.0202	0.0020	0.1843	0.2025
Driving for pleasure	15.1652	18.8081	11.8906	-3.6429	3.2745
Fishing	5.8955	0.6566	0.4922	5.2389	5.4033
Golfing	7.8939	0.7677	1.7657	7.1263	6.1283
Hiking	1.2061	0.0808	0.3393	1.1253	0.8667
Horseback riding	0.9606	0.5455	0.2098	0.4152	0.7508
Hunting	0.8227	0.1515	0.7461	0.6712	0.0767
Ice Skating	0.8333	0.1414	0.1618	0.6919	0.6715
Jogging	18.7697	20.8284	35.4671	-2.0587	-16.6974
Swimming in a lake	3.6545	0.3939	0.5156	3.2606	3.1390
Nature observation	6.6939	1.1818	1.3587	5.5121	5.3352
Off Road Vehicles	2.1121	0.4545	1.2480	1.6576	0.8641
Picnicing	3.1924	1.8586	1.3767	1.3338	1.8157
Swimming in a pool	9.7576	1.8182	2.8141	7.9394	6.9435
Recreation Vehicle Camping	1.1606	0.0202	0.0114	1.1404	1.1492
Sailing	0.8849	0.1212	0.2778	0.7636	0.6071
Tennis	2.0697	5.3435	6.3055	-3.2738	-4.2358
Tent Camping	0.5045	0.1717	0.3432	0.3328	0.1614
Walking	53.5136	52.8748	87.5935	0.6389	-34.0798
Cross country skiing	0.3258	0.0101	0.0030	0.3157	0.3228
Total activity days-All activities	162.0485	130.9597	191.4961	31.0888	-29.4476

The mean days of participation in an activity can be decomposed into components using regression techniques.

$$\text{Average Number of Days} = \beta_0 + \beta_{Age}X + \beta_{Education1}X + \beta_{Education2}X + \beta_{Education3}X + \beta_{Education4}X + \beta_{Income1}X + \beta_{Income\ 2}X + \beta_{Income3}X + \beta_{Income4}X + \beta_{Income5}X + \beta_{Income6}X + \beta_{Employment1}X + \beta_{Employment2}X.$$

Where:

$Income_i$ = dummy variables for 7 levels of income.
$Education_j$ = dummy variables for 5 levels of education.
$Employment_k$ = dummy variables for 3 levels of employment.
X = average values for the respective variables.

The average days of African American participation in baseball, 4.25, can be represented in a regression equation as:

$$4.25 \approx 1.79 + (-.02 \times 41.04) + (4.43 \times .17) + (19.37 \times .19) + (-.15 \times .38) + (1.35 \times .18) + (1.17 \times .57) + (-.83 \times .08) + (-5.95 \times .27) (-10.00 \times .02) + (-3.41 \times .22) + (-9.67 \times .02) + (-3.27 \times .22) + (14.58 \times .10)$$

Substituting mean income, education, and age for the White sample into the above regression equation estimates the average number of days of participation for African Americans if they had the same levels of income, age, and education as Whites with nothing else changed (e.g., Althauser and Wigler 1972; Iams and Thornton 1975; Jones and Kelley 1984). The participation in baseball by African Americans having the same income, education, and age as Whites becomes:

$$7.70 \approx 1.79 + (-.02 \times 43.04) + (4.43 \times .07) + (19.37 \times .37) + (-.15 \times .25) + (1.35 \times .21) + (1.17 \times .57) + (-.83 \times .13) + (-5.95 \times .12) (-10.00 \times .01) + (-3.41 \times .16) + (-9.67 \times .02) + (-3.27 \times .02) + (14.58 \times .01)$$

This same analysis was performed for all 26 activities and the total days of participation across all activities. The results are summarized in Table 1. In 12 activities standardization for age, education, and income reduced the difference in participation between the two groups was reduced. For 14 activities the difference became larger than before standardization. Prior to standardization there were five activities where African American participation was higher than Whites (basketball, bike, drive, jog, and tennis). After standardization there were four activities where African Americans participation exceeded that of Whites (baseball, jogging, tennis, and walking), plus the total days over all activities. One of the arguments in support of the marginality hypothesis is that the outdoor recreation participation of African Americans is often lower than that of Whites in many activities because of the generally lower socio-economic levels of African Americans. In this analysis, when African Americans are assigned the same average age, income, and education of Whites (i.e., standardization), their participation increases in 15 activities, but decreases in 11 activities.

Eleven activities fit the classic "marginality hypothesis" in that standardization increased African American participation and reduced the difference with Whites. Some of those activities might be expected to fit the marginality model including sailing, golf, and backpacking. There are some other activities, such as pool swimming, where differences in participation do not appear to be a result of marginal status. Standardization reduced participation by African Americans and increased the difference between African Americans and Whites in 10 activities. Some of the activities were urban and might be expected to exhibit such a pattern of behavior such as basketball, bicycling, and picnicking. There also are other activities, that seem quite inappropriate in that category, such as boating and RV camping.

While the pattern of outcomes across the individual activities is not particularly clear, when all activities are considered, there would be an increase in the number of days of participation by African Americans after standardization. Total African American participation exceeds the total for Whites. This result suggests some support for the marginality hypothesis.

Discussion

Limited support is present for the marginality hypothesis. Standardization reduced African American/White differences in 12 of 26 activities; and African American participation increased in 15 activities. There is not a clear pattern of results across the activities. Perhaps the pattern of results across activities would be clearer if additional variables were included in the standardization. Such as urban residence and characteristics of the family.

It is difficult to attribute the remaining differences between African American and White recreation to subcultural differences. The variables examined were "general" in the sense that they were not directly related to recreation. The tendency for African Americans to concentrate their recreation activity close to home has often been attributed to lower incomes, reduced access to transportation, and the desire to recreate in large extended-family groups. Examination of discrimination within the recreation setting might be more fruitful. There is increasing evidence of discrimination as a factor affecting participation patterns of African Americans and other groups (West 1989; Blahna and Black 1993; Gobster and Delgado 1993). Much of the recreation behavior of African Americans could be attributed to efforts to avoid discrimination in the recreation setting.

The fact that standardization produces the highest increases in average days of participation for activities already at relatively high levels of participation for African Americans suggests that the marginality explanation is most valid in instances where barriers are already relatively low or there are subculture preferences for the activities. Neither of these explanations were examined in this research but are suggested by the results.

Summary

This analysis offers limited support for the marginality hypothesis for explaining African American/White differences in days of participation. Income, age, and education standardization increases African American participation in 15 selected outdoor recreation activities and reduces the between group difference in twelve activities. Standardization for additional socio-economic variables such as urban/suburban/rural residence or family size and structure might offer more support for the marginality thesis. There appears to be ample room, however, for the ethnicity thesis as well as discrimination for explaining the African American/White differences in outdoor recreation participation by this sample of Illinois residents.

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FRONTCOUNTRY ENCOUNTER NORMS

AMONG THREE CULTURES

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Existing normative studies have focused on backcountry encounter norms reported by North Americans. This study extends previous research by comparing encounter norms reported by three different cultures - North Americans, Europeans, and Japanese - in a frontcountry day use recreation area. Data were obtained from on-site surveys distributed at the Columbia Icefield in Jasper National Park. Results indicated that European and Japanese respondents were more likely to have an encounter norm than the North Americans. Although the tolerance limits did not vary by culture, consistent with previous research, when contacts exceeded norm tolerance limits, crowding increased regardless of cultural origin.

Introduction

The normative approach has been developed as a useful way to conceptualize, collect, and organize empirical data representing value judgments about resource management issues (Shelby and Heberlein 1986, Vaske et al. 1993). Norms are standards that individuals use for evaluating activities, environments or management proposals as good or bad, better or worse (Vaske et al. 1986). They define what people think behavior *ought to* or *should be*.

Since the initial conceptual illustration of the normative model to natural resource environments (Heberlein 1977), the approach has been empirically used to understand *encounter norms* (Vaske 1977, Vaske et al. 1986, Shelby 1981, Heberlein and Alfano 1983, Heberlein et al. 1986, Whittaker and Shelby 1988, Patterson and Hammitt 1990, Williams et al. 1991, Roggenbuck et al. 1991, Shelby and Vaske 1991, Young et al. 1991, Martinson and Shelby 1992), and *perceived ecological impacts* (Shelby et al. 1988, Vaske and Donnelly 1988, Whittaker and Shelby 1988, Shelby and Shindler 1990, Shelby and Whittaker 1990). Encounter norms have been examined for canoeing, rafting, tubing, sailing, fishing, hunting, backpacking, and camping.

For backcountry resources, Vaske et al. (1993) suggest several general conclusions regarding norms. First, a number of specific types of norms can be identified. Encounter norms exist for particular types of contacts with certain types of visitors at particular places and for certain types of experiences. It is also apparent that recreationists have norms for acceptable distances between individuals, encounters with others at campsites or attractions, and waiting times to run a rapids. Second, individuals are capable and willing to specify their norms when asked. Third, although encounter norms vary for different activities and different areas, there is some consistency in the norms for certain types of backcountry experiences. For example, norms for encounters in wilderness areas tend to be quite low (approximately 4 or fewer encounters in most cases). Fourth, when encounters exceed an individual's normative tolerance limit, crowding (the subjective negative evaluation of a given encounter level) increases.

Most existing normative studies have been conducted in backcountry or wilderness areas which typically provide low density recreation opportunities. Research related to encounter norms in frontcountry settings is limited (Freimund et al. 1994). For these higher use environments, encounters may be relatively less important than other types of impacts (Whittaker 1992). Findings from the New River in West Virginia support this hypothesis (Roggenbuck et al. 1991, Williams et al. 1991). The New is a day use river with use levels reaching an average of over 1,000 persons per day on summer weekends. Following Shelby (1981), respondents were asked about three different types of trips on the New River: wilderness whitewater, scenic whitewater, and social recreation (Roggenbuck et al. 1991). For each type of trip, respondents were asked to give norms for the number of other boats seen on the river, percent of time in sight of other boats, and number of rapids where it was acceptable to wait in line before running. Response choices were "makes no difference," "makes a difference but can't give a number," or to give a number. A large percentage of New River floaters did not specify a number. There was, however, considerable variation across the type of experience and the type of norm; 1258 percent said "makes no difference," 13-34 percent said "makes a difference but can't give a number," and 29-66 percent gave a number. Boaters were more likely to specify a norm (and less likely to say "makes no difference") for the experiences closer to the wilderness end of the spectrum. They were also more likely to specify a norm for waiting at rapids than for number of encounters or time in sight.

Data from the Deschutes River suggest similar relationships. The Deschutes is a higher density river, and few users believe it offers a wilderness experience (Shelby et al. 1987). A higher percentage of users "don't care" about time in sight of other boaters, while a lower percentage felt this way about discourteous behavior, sharing or passing up camps, and human waste impacts. Relative to campsite impacts, users appear more concerned about sharing camps or camp competition than about camping within sight or sound of other individuals.

Differences in the types of impacts considered relevant may also vary across different cultures. Although virtually all recreation studies of encounter norms have concentrated on North American visitors, research in sociology and psychology identify cultural distinctions. In a study comparing Asians, British and Southern Europeans relative to the way they view and adapt to the physical environment, Gillis and associates (1986) found that Asians were most tolerant of high density, with respondents of British origin least adaptable. These findings are consistent with research (Altman 1975, Hall 1966, Rapoport 1977) showing that the Japanese have developed a wide range of strategies for coping with high density situations. Others (Homma 1990), however, conclude that while the Japanese view crowding as a negative experience, increasingly high levels of density and recent cultural/social changes have inhibited the effectiveness of various coping strategies.

Based on this previous research, this paper examines the following hypotheses:

H_1: Norm existence will vary by culture.

H_2: For those visitors who specify an encounter norm, tolerance limits will vary by culture.

H_3: Irrespective of cultural influences, when encounters exceed norm tolerance limits, crowding will increase.

Study Area

Results from a study conducted at the Columbia Icefield in Alberta, Canada were used to test these hypotheses. The Columbia Icefield is the most heavily visited day use area in Jasper National Park. More than 900,000 visitors traveled the Icefields Parkway through Jasper National Park in 1993, with over 500,000 stopping at the Columbia Icefield during May through September. Most of these individuals visit the adjacent Athabasca Glacier on one of the commercial snocoach tours. Visitors are typically 55 years of age or older, making their first trip to the area, and are of foreign origin (See Vaske et al. 1994, for a more complete description of the study area and visitor profile).

Methods

Data were obtained over a 12 day interview period during August and September of 1993. For purposes of this paper, individuals who visited the area on a commercial snocoach (n = 501) were included in the analysis. Respondents were asked to complete a onepage, selfadministered survey at the conclusion of their visit (response rate = 97%).

Independent Variable: Country of origin served as the independent variable. To ensure sufficient sample size, three cultural categories were identified: 1) *North Americans* Canadian and American visitors; 2) *Europeans* Italian, French, German and British visitors and 3) *Japanese*.

Dependent Variables: Three dependent variables were examined. *Encounters with others* were assessed by asking individuals, "While walking on the glacier, about how many other visitors were within eyesight?." This was an openended question in which the respondents specified a number. Following previous research (Shelby 1981, Vaske et al. 1993), *encounter norms* were measured by asking respondents "What is an acceptable number of other visitors to have within eyesight while you are walking on the glacier?" Response categories allowed individuals to either specify a number or to indicate that it did not matter how many visitors were within view. Individuals who checked this latter option were in essence indicating they did not have a norm for this situation. *Perceived crowding* was measured on a 9point scale ranging from "not at all" to "extremely" crowded (See Shelby et al. 1989 for a review of the crowding variable).

Results

The first hypothesis suggested that the three cultures would vary in the percentage of individuals who specified an encounter norm. The data supported the predicted relationship. Approximately half (54%) of the North Americans indicated a tolerance limit for seeing other visitors while walking on the glacier. By comparison, 77% of the Japanese and 79% of the Europeans specified a tolerable number of encounters. These differences were statistically significant ($\chi^2 = 21.59$, $p < .001$). Consistent with prior research in high density, frontcountry situations, this suggests that encounter norms for North Americans may be relatively less important than other impact indicators.

Table 1. Norm existence reported by three cultures.

Culture	% Reporting an Encounter Norm
North American	54
European	79
Japanese	77

$\chi^2 = 21.59$, $p < .001$

Among those who specified a norm tolerance limit, there were no significant differences among the three cultures relative to the average number of other visitors each group could tolerate (Column 1, Table 2). The average number of people the three groups could tolerate ranged from 95 for Europeans to 114 for the Japanese ($F = 1.97$, $p < .14$). These findings do not support Hypothesis 2. Column 2 of Table 2 shows the median acceptable number of contacts each culture could tolerate. The median acceptable encounter level can be interpreted as the contact level above which half of the respondents find the number of encounters unacceptable. Half of the North American and Japanese visitors could tolerate being in sight of 100 other visitors on the glacier. The median for Europeans was 75. As indicated by the range statistic (Column 3, Table 2), the acceptable number of contacts ranged upwards to 500 other visitors. These high tolerances, however, were reported by fewer than 5 respondents.

Table 2. Norm tolerance limits reported by three cultures.

Culture	Mean *	Median	Range
North American	99.07	100	1-250
European	95.53	75	5-500
Japanese	114.47	100	2-500

* $F = 1.97$, $p < .14$

Of those who reported an encounter norm, between 39 and 48 percent of the three cultural groups reported more contacts with others than their norm limit (Table 3). As predicted by Hypothesis 3, mean differences in perceived crowding were significantly higher for individuals indicating more contacts than their norm. For example, among the North Americans, those who reported more contacts than their norm had a mean crowding score of 5.27 (moderately crowded), compared to 2.00 (not at all crowded) for those reporting fewer contacts than their norm ($t = 5.57$, $p < .01$). This pattern of findings was observed for all three cultures.

Table 3. Norms and perceived crowding for three cultures.

Culture	Reported Contacts Compared to Norm: More Contacts	Reported Contacts Compared to Norm: Fewer Contacts	Mean Crowding Scores: More Contacts	Mean Crowding Scores: Fewer Contacts	t-value
North American	39%	61%	5.27	2.00	5.57 *
European	48	52	5.11	2.00	6.41 *
Japanese	45	56	4.01	2.32	7.27 *

* $p < .01$

Conclusions

Compared to backcountry settings, frontcountry visitors of North American origin were less likely to have an encounter norm (54%). Among the Europeans and Japanese, however, over three quarters gave an encounter norm when asked. Given the relatively higher densities these latter cultural groups may be accustomed to, it may be easier for these individuals to specify a tolerance limit. Generalizing this observation should be approached cautiously, however, due to the sample size constraints which prohibited the analysis of individuals from specific European countries. Moreover, given the differences between British and Southern European respondents noted by Gillis et al. (1986), the topic remains an issue for future investigation.

The encounter norm variable used in this investigation allowed for two types of responses: specifying a number of acceptable encounters or indicating that the number of encounters did not matter. These two options are likely to be sufficient for low density backcountry / wilderness settings where visitors are more likely to have a tolerance limit and where the presence of even a few other individuals may have a negative impact. In high density, frontcountry situations, however, the response categories ("makes no difference," "makes a difference but can't give a number," or specify a number) as suggested by Roggenbuck et al. (1991) may be more appropriate.

Among those who specified an encounter norm at the Columbia Icefield, the reported tolerance limits were considerably higher than those previously reported in backcountry research. For all three cultures, the average was approximately 100 contacts. This compares to wilderness research where 3 to 4 contacts represents the norm. Future research in other high density areas will assist in the definition of an appropriate encounter standard for frontcountry settings.

Some authors (Whittaker 1992, Brunson and Rodriguez 1992) have noted that other types of impact indicators may have a greater influence than encounters in frontcountry settings. Included among these indicators are norms for wait times to use facilities, depreciative behavior, human waste and litter. Future research is needed to examine the magnitude of these types of impacts on the quality of the visitor experience.

Taken together, the findings presented here suggest that Europeans and Japanese are more likely to have an encounter norm in high density situations than North Americans. Among those who reported a tolerance limit, however, the norms did not vary by culture. Consistent with previous research, when contacts exceeded norm tolerance limits, crowding increased regardless of cultural origin.

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Methods and Measurement



EFFECT OF INVOLVEMENT LEVEL ON MAIL PANEL SURVEY RESPONSE RATES

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A panel survey of golfers, skiers and windsurfers was conducted using mail questionnaires which were distributed three times over the course of a calendar year; in-season, off-season, and pre-season. Respondents' levels of enduring activity involvement were measured using Laurent and Kapferer's (1985) Involvement Profile scale. No support was found for the hypothesis that panel dropouts would be less involved with the activity than would those who completed all three data collection phases.

Introduction

Leisure research has a rich tradition of survey-based studies and critiques related to sampling techniques and response rates abound (e.g., Choi, Ditton and Matlock 1992; Dolsen and Machlis 1991; Wellman, Hawk, Roggenbuck and Buhyoff 1980). However, the performance of leisure researchers regarding the reporting of response bias checks for their survey research remains mixed. Fewer than 35% of empirical studies in the Journal of Leisure Research and Leisure Sciences since 1990 reported a response bias check. The purpose of this study was to investigate possible sampling biases that may result from the level of activity involvement held by potential survey respondents. Specifically, it was hypothesized that sample members with high activity involvement scores would be more likely to respond to repeated mailings in a panel survey study than would sample members with low activity involvement scores.

Involvement is an unobservable state of motivation, arousal or interest that is evoked by a particular stimulus or situation and has drive properties (Rothschild 1984). In leisure research the particular stimulus generally refers to an activity context (e.g., Backman and Crompton,1990; Dimanche, Havitz and Howard 1991; McIntyre 1989; McCarville, Crompton and Sell 1992; Norman 1991). Drive properties generally refers to the presumed influence of involvement on purchase decisions and on leisure behavior (see Reid and Crompton 1993 for a theoretical discussion of purchase decision issues). Indeed, involvement level has been linked to decisions such as whether or not to travel for pleasure (Norman 1991), to continue or discontinue recreation participation (Backman and Crompton,1990), length of participation, frequency of participation, and money spent on recreation related products (Howard and Havitz 1993).

The advantages and disadvantages of mail surveys in comparison with other data collection methods have been widely discussed (Dillman 1983). Random sampling is often used to ensure that the sample is reasonably representative of the broader target population to which results are to be generalized. Babbie (1992, p. 197) argued that "a sample will be representative of the population from which it is selected if all members of the population have an equal chance of being selected in the sample." Theoretically, random sampling eliminates problems related to noncoverage. However, Frankel (1983, p. 24) noted that survey populations may "differ from the target population because of noncoverage and non-response." Nonresponse is generally more difficult to address than is noncoverage because simple inclusion within a survey sample frame provides no guarantees that subjects will actually respond.

The affect of issue salience as a moderating variable on response rates is often implied. Intuitively, it seems likely that Audubon Society members would be more predisposed to respond to a survey on birding than would members of the general population. This may seem like an extreme example, nevertheless much leisure research is conducted on populations with relatively diverse levels of activity commitment and controls for issue salience among survey respondents are seldom reported. The Involvement Profile (IP) scale (Laurent & Kapferer 1985; Dimanche et al. 1991) may provide a promising method for measuring issue salience among respondents and nonrespondents alike.

Method

Sample and Data Collection

Respondents were selected from physical education activity classes related to golf, downhill skiing, or windsurfing at a large west coast university. These classes were open to all undergraduate and graduate students enrolled at the university, thus respondents represented numerous academic majors (leisure studies majors comprised less than five percent of the sample). Golf and downhill skiing classes were available at four different levels: beginner, intermediate, advanced, and competitive. Windsurfing classes were offered at two levels: beginner and intermediate/advanced. This mix ensured a reasonably wide range of activity involvement among members of the sample. Respondents were recruited to complete the study only in the context of the activity for which they were enrolled.

The questionnaire was initially completed in-season. Questionnaires were distributed in February for downhill skiing and in May/June for golf and windsurfing. Respondents were recruited in-class by a principal investigator who explained the voluntary nature of the study and the explained the data collection procedures. Respondents were notified that some of them would receive follow-up questionnaires in several months. All students in attendance during the recruitment procedure were invited to participate. Over 90 percent of the potential respondents agreed to participate in the research by completing the in-season questionnaire.

Respondents who completed usable questionnaires were mailed the second questionnaire several months after the in-season data collection. Postcard reminders were sent to all participants one week later. Non-respondents were sent replacement questionnaires one week after the postcard was mailed (two weeks after the initial second contact). Non-respondents were also contacted by phone whenever possible. Off-season data collection occurred in May/June for downhill skiing and in November/December for golf and windsurfing.

Several months later, the third questionnaire was mailed to all respondents who responded to the off-season data collection. Identical procedures to those used in the off-season were followed during this pre-season data collection. The pre-season data collection occurred in October/November for downhill skiing and in February/March for golf and wind-surfing.

Questionnaire

All data were collected with paper and pencil questionnaires. The questionnaire also included socio-demographic items and behavioral questions related to respondents' participation and purchase patterns and an 18-item version (three items each purporting to measure six facets of involvement) of the Involvement Profile (IP) scale written in the context of one of the three recreational activities.

There is general agreement that involvement has multiple facets. Importance, pleasure, sign, risk probability, risk consequences, and centrality have received support from various researchers (Havitz and Dimanche 1990). The IP scale was developed to measure five facets: 1) the importance of the product class to the

individual; 2) the pleasure or hedonic value derived from the product; 3) the sign or symbolic value (what a participant's perception of what her/his participation says about her/him to other people) attributed to the product; 4) the risk probability associated with a potential mispurchase; and 5) the risk consequences associated with a mispurchase (Laurent and Kapferer 1985). The sixth facet, centrality, has received support primarily in the leisure literature (McIntyre 1989; Siegenthaler and Lam 1992; Watkins, 1986). Centrality refers to the extent to which a participant's lifestyle and social networks revolve around a recreational activity.

The IP scale has been subjected to tests of trait and discriminant and convergent validity, multiproduct fit, reliability (internal consistency), and known group tests of construct validity (viz., Laurent and Kapferer 1985; Havitz, Dimanche and Howard 1993). The IP scale performed well in these studies and is probably the most widely used involvement scale in leisure research. Ten leisure involvement studies have been reported in the past four years using the IP scale. Factor analyses indicated in eight of the 10 data sets that the importance and pleasure facets merge in leisure contexts. This composite importance-pleasure facet has been labeled the attachment facet by some researchers. It represents an interesting derivation from research with consumer goods where the combination is rarely reported, and then only in the case of products, such as chocolate, which have hedonic properties (Zaichkowsky 1990).

Despite the small number of items in each IP subscale, the internal consistency of the various subscales has been consistently high across the 10 data sets. Importance/pleasure (or attachment) alphas have ranged from .69 to .89 (above .80 in eight of 10 studies); sign (or self expression) alphas have ranged from .66 to .96 (above .80 in six of 10 studies); risk probability alphas have ranged from .57 to .90 (over .80 in three of seven studies); and risk consequence alphas have ranged from .60 to .89 (over .70 in three of seven studies). McIntyre did not include risk items in either of his questionnaires and the risk dimensions failed to achieve eigenvalues of 1.0 in the Madrigal et al. research. Centrality alphas (only reported in the two McIntyre data sets) were .64 and .70. The risk facets have been criticized by some researchers as not directly applicable to enduring involvement (Mittal 1989; McIntyre 1989). In addition, factor analyses have consistently shown risk facet eigenvalues to be lower than those of other facets. Nevertheless, risk facets have received theoretical support in the literature (Havitz and Dimanche 1990; Laurent and Kapferer 1985) and have provided valuable information in several involvement studies.

Response

Over 90% of approximately 300 potential respondents completed the in-season questionnaire. All 282 in-season respondents were sent second round questionnaires. Current addresses could not be located for twenty-seven (9.6%) respondents during the off-season data collection and an additional seven (2.4%) addresses were unavailable during the pre-season data collection. Correcting for non-deliverable questionnaires, 69% of first round respondents completed the second round (off-season) questionnaire and over 52% of first round respondents completed the third round (pre-season) questionnaire. Response rates were highest for downhill skiing and lowest for boardsailing.

Comparison of the socio-demographic and behavioral characteristics of members of the present sample with the characteristics of a representative sample of American adult golfers and downhill skiers (data were not available for boardsailing) showed that the present sample over represented females, younger adults, singles, and highly educated people (Simmons Market Research Bureau 1991). As a group, members of the present sample also participated at above average rates (about 20 times per year for all three activities). Fewer than one third of adult golfers and 10% of adult skiers participate 20 or more times annually (Simmons Market Research Bureau 1991).

Results

Prior to hypothesis testing, the factor structure of the revised IP scale was examined in both activity and product contexts using principal components and principal axis factoring procedures and internal consistency scores (Cronbach's alpha) were obtained. These measures revealed a four-factor structure (importance, pleasure and centrality items generally loaded on one factor) and reliability levels consistent with past leisure involvement research. Several items with mixed or low loadings were not included in the hypothesis test. Males were over represented in the single response group whereas over half of the two and three response group were female ($X^2 = 9.92$; df = 2; $p < .01$). Although not statistically significant at conventional alpha levels, mean age of respondents ($F = 2.66$; df = 2, 273; $p = .07$) showed a pattern whereby older respondents were over represented in the single response group. Therefore sex and age were included as independent variables along with involvement scores (four facets including importance-pleasure, sign, risk probability and risk consequence) in the hypothesis test. The dependent variable was response pattern over the course of the panel survey. Multivariate analysis of variance (MANOVA) revealed no significant relationship between the independent variables and panel response patterns (Multivariate $F = 1.06$; df = 16, 1032; $p < .39$). Thus, the hypothesis was not supported.

Discussion and Implications

Long standing concern has been expressed regarding the extent to which survey respondents accurately represent the populations from which they are drawn. This concern will become more pronounced in the future if leisure research evolves from its heavy reliance on cross-sectional methodologies to a greater proportion of longitudinal inquiry as has been predicted and advocated. In general, the results provide good news for leisure researchers conducting panel surveys through the mail. Significant differences in IP scores among one, two and three time respondents would have suggested that response patterns were biased by respondents' levels of enduring activity involvement. Such differences could call into question the reliability and validity of panel research efforts. The results are especially interesting given their contrast to the demonstrated usefulness of involvement profiles in predicting behavior and for segmenting recreation markets.

Several limitations should be noted regarding this exploratory effort. First, no attempt was made to compare involvement levels of non-respondents with those who responded at least once. Such a test would have been difficult to conduct both because fewer than 20 potential respondents declined participation and because no measure of enduring involvement was obtained for members of that group. These results cannot be generalized from panel surveys to cross-sectional surveys. Second, the activity contexts were limited. Third, survey methods (e.g., telephone) other than mail surveys were not examined. Finally, the length of the panel survey was relatively short and was completed within the span of one year. This study should be replicated in a more activity contexts, over longer periods of time, and conducted in other survey contexts before definitive statements regarding response rates and enduring involvement levels can be made.

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FORECASTING OUTDOOR RECREATION PARTICIPATION: A COHORT-COMPONENT PROJECTION MODEL FOR ILLINOIS RESIDENTS [1]

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Population projections for Illinois predicts lower growth, an older population, and increased racial diversity. If percent of the population participating in outdoor recreation activities by age and race remains at present levels, cohort-component projection models suggest that with projected changes in the population between 1990 and 2025, the number of Illinois participants engaging in many outdoor recreation activities will increase at a slow rate or decrease. Future participants will be older and increasingly from non-white groups.

Demographic Trends

In the years ahead the Illinois population is projected to grow more slowly than in the past, become older, and have larger racial minority components (State of Illinois 1990). The Illinois population, which grew 15 percent over the decade of the 1950's and slightly more than 2 percent in the 1980's, is expected to grow at a slower rate in the decades ahead. Accompanying slower population growth and longer life spans will be an older population. Individuals under 30 made up more than half of the population in 1980, but are projected to account for 37 percent of the total in 2025. There will be increased racial diversity in the years ahead as well. Between 1990 and 2025 Illinois is projected to experience a loss of 770,000 White residents, while the number of African American residents increases by 367,000 and the number of other residents increases by 646,000. An older population will be particularly significant with the White population, somewhat less significant with African Americans, and much less significant with other races. Overall, between 1990 and 2025 increases in numbers are projected for Whites age 50 and above, African Americans age 35 and above, and others in all age categories.

Variation in Participation

Surveys of the Illinois population in 1987 and 1989 indicate statistically significant differences in outdoor recreation participation (i.e., percent participating) according to age and racial background (Dwyer 1993a), suggesting that changes in recreation participation could accompany changing age and racial/ethnic structure of the population in the years ahead. The variations in participation that are associated with race and age are summarized below. Subsequent discussion explores their implications for outdoor recreation participation in the years ahead.

Race

The most distinctive pattern across racial groups is that African Americans are significantly less likely than Whites or others to participate in a large portion of the outdoor recreation activities studied, particularly those that take place in a wildland setting or involve water/snow/ice. There is a tendency for African Americans and others to participate at a similar or higher rate than Whites in athletics and activities that take place close to home (Dwyer 1993b).

Age

There are significant differences in participation across age categories for every outdoor recreation activity included in the study. The general trend is a decrease in participation with older individuals, with activities differing as to when that decrease begins and how steep the decline will be. With nearly half of the activities (and particularly sports and athletics) there is a fairly steady decline in percent participating with age starting at fairly young age class (20-24), with nearly all of the other activities starting decline shortly after that age class. A notable exception is nature study where percent participating increases with age class through age 40-44, and then decreases slowly (Dwyer 1993a).

Some Projections for the Future

Murdock et. al. (1990, 1991) developed a cohort-component projection model that uses projections of the population by age and race/ethnicity, together with activity-specific rates of participation by age and race/ethnicity to project number of participants in recreation activities in the years ahead. This approach is discussed by Dwyer (1993a, 1994a, 1994b). With the cohort-component projection model, the population is assigned to groups according to racial/ethnic and age classes (i.e., African Americans age 18-24), and estimates of the number of participants in an activity by the group are derived by multiplying the population by the percent of the group that participates in the activity. Total number of participants in the activity is the sum of the number of participants from each of the groups in the total population. Participation in future years is estimated from projections of the population by race/ethnicity and age. In the absence of projections of activity-specific participation rates by race and age for the years ahead, it is usually assumed that participation rates will remain the same over time. Thus the model provides estimates of future numbers of participants in an activity given expected changes in the population by age and race/ethnicity, assuming there will be no changes in participation rates by age or race/ ethnicity. The percent of the total population that participates in an activity may change over time with changing age and racial structure of the population. In sum, the model reflects three components of demographic change that are likely to influence the number of participants in a particular activity in the years ahead; changes in total population, age structure, and racial/ethnic structure. All other factors that influence outdoor recreation participation are assumed to remain the same over time.

Estimation of a cohort-component model is often limited by the availability of data, and in particular the need to have data on population projections match up with activity participation rates. Population estimates are generally taken from the U.S. Bureau of the Census or state agencies. Activity participation rates come from surveys of the general population. It is critical that the age and race categories used in outdoor recreation surveys match up with those used in population estimates. The model can be used to predict the number of days of participation in an activity; but that effort requires more data on recreation participation since there must be a sufficient sample of participants in the activity by age and race/ethnicity to estimate average days of participation for each group.

A cohort-component projection model was used to project future participation in outdoor recreation activities by Illinois residents based on Illinois Bureau of the Budget projections of the future population and its age and racial structure, as well as constant activity participation rates for age and racial groups developed from surveys of the Illinois population in 1987 and 1989. The two surveys were combined since the activity participation rates were similar. There was another survey in 1991 that also had similar participation rates; but age was not included in the questionnaire so it was not possible to use that information in this study. The results of that survey plus an earlier one in 1985 suggest relatively stable activity participation rates for Illinois residents over the period 1985-1991. The models project that growth in number of Illinois participants in 31 outdoor recreation activities during the period 1990-2025 will be lower than expected growth in the Illinois population (Table 1). While the Illinois population

aged 15 and above is expected to grow by 6.6 percent between 1990 and 2025, changes in the number of outdoor recreation participants 15 and older are expected to range from +4 percent to -21 percent, with a median of -10 percent. An older population and increasing numbers of racial minorities are responsible for keeping the projected growth in number of participants below that of the population, and for the projected decreases in the number of participants in 27 of the 31 outdoor activities. Projected decreases in number of participants that were attributable to aging ranged from 1 to 21 percent of the 1990 participation. Changing racial distribution of the population was associated with increases of up to 1 percent in four activities, and decreases of up to 14 percent in 27 activities. Overall, a larger change in number of participants was attributed to aging for 21 activities, while race was associated with a larger change in 10 activities.

The largest projected increases in number of participants are for activities that are relatively popular among older Americans and racial minority groups; and include walking, driving, and picnicking. The largest projected decreases are for activities that are particularly popular with younger White Americans; and include waterskiing, snowmobiling, trapping, and downhill skiing.

Projections suggest changes in the racial background and age of participants. In all 31 activities a decrease is projected in the number of White participants; but the number of African American participants is projected to decrease in only two activities -- downhill skiing and soccer, and numbers of participants from the other racial category are not projected to decrease in any activities (Table 2). Increases in the number of other participants is projected to exceed those of African Americans in 28 out of 31 activities. This is a reflection of greater increases in the other population, the concentration of a larger part of the increased growth of the other population in the younger age classes that have higher participation rates, and the generally higher participation rates for the other population when compared to African Americans. Participants in outdoor recreation activities are projected to be older and increasingly from African American and other racial groups. For example, there is projected to be an increase in White runners/joggers over age 45, African American joggers over age 35, and other joggers over age 15.

The projections of the numbers and characteristics of future participants developed for Illinois must be evaluated in light of two key assumptions of the model: (1) Participation rates by age and race will not change over time, and (2) Variables other than age and race that may influence participation are not explicitly considered. For a discussion of these assumptions and their implications for predicting the number of participants in selected activities in the years ahead, see Dwyer (1993a) who also provides suggestions for improved predictions, such as allowing participation rates to change over time. As the racial and age structure of the population changes over time, there will also be other demographic changes such as income, family structure, and education; as well as changing tastes and preferences and changing availability of opportunities to participate. It is important to recognize that these other factors exist and in some instances may overwhelm some of the forces for change that we are dealing with here. But for now we are focusing our attention on population growth and changing age and race and their possible implications for future participation.

Implications for Management

If participation rates in outdoor recreation activities by age and race remain constant over time, changes in the Illinois population and its age and racial composition are likely to bring significant changes in the outdoor recreation participation patterns of Illinois residents. While projected changes will vary significantly across activities, the number of outdoor recreation participants is projected to decrease or increase at a slow rate, and participants will be increasingly older and from non-white groups. The projected changes in the numbers of participants as well as their ages and racial/ethnic backgrounds will have wide-ranging implications for recreation resource management programs including design and management of recreation settings, the focus of visitor programs, information and marketing efforts, and the selection and training of those who work with visitors. It may be necessary to review fee structures in the years ahead, given the increasing proportion of participants that will qualify for "senior citizen rates." The selection of staff and the development of training programs must address the needs of increasingly diverse customers. Increased attention will need to be given to communication between managers and planners and the increasingly diverse populations that they will serve. These implications will be especially significant for the management and use of resources in or near urban centers which tend to be heavily used by racial/ethnic minorities and older Americans. Change will be the hallmark of recreation resource management programs even more than in the past, and it will be increasingly important to maintain flexibility and the ability to respond to the changing needs of changing customers.

Implications for Research

If information from recreation surveys is to be used to estimate participation rates for racial/ethnic groups and age categories, it is critical that the racial/ethnic and age variables are defined in a way that is consistent with those used in the population projections. This lack of compatibility is often a problem with cohort-component modeling. In the present analysis, the population estimates for Illinois were reported for three racial groups (White, African American, and other). The outdoor recreation survey of Illinois residents used five categories (White, African American, Hispanic, Asian, and other). Consequently, the participation data had to be aggregated into three groups to match up with the population estimates. There was no problem with age since individuals were asked to provide their year of birth and this made it possible to aggregate age into any desired classes; but it is important that the minimum age of those surveyed for their recreation participation correspond to the lower limit of one of the population categories used in the population projections. Limited observations from minority groups resulted in sketchy information on participation rates for those groups, particularly among older participants. At the national level, the U.S. Bureau of the Census records race as White; African American; American Indian, Eskimo, and Aleut; or Asian and Pacific Islander. The Census also asks if an individual is of Hispanic origin. The Census reports individuals of Hispanic origin across all of the races. This is seldom done in recreation surveys and it makes for problems in compatibility. It is also important that sufficient data are gathered on participation in recreation activities by minority groups of all ages, particularly if estimates of the number of participant days are desired. This might require oversampling those groups. It is also critical that attention be given to estimating future activity participation rates. Among the obvious problems with using current rates to project future participation is that older individuals sampled today grew up in a quite different environment than exists today and is likely to exist in the years ahead. As such, their participation was conditioned by the environment in earlier times, and may not be indicative of the behavior of present or future older citizens. Examples of trends that may make these participation rates change over time include increased availability of resources, increased activity of older Americans, and reduced barriers to use of recreation resources by minority groups. These trends need to be considered in efforts to project future participation rates.

Table 1. Predicted changes in the number of participants on outdoor recreation activities in Illinois, 1990 and 2025, and components of those changes.

Activity	Predicted number of participants age 15 and above (in thousands) 1990	2025	Change 1990-2025[1]	Components of change in participation 1990-2025 (in thousands) Population growth	Changes in Age	Race
Run/jog	2,732	2,516	-216 (-7.9)	+181 (+6.6)	-280 (-10.2)	-118 (-4.3)
Walking	6,433	6,675	+242 (+3.8)	+427 (+6.6)	-65 (-1.0)	-119 (-1.8)
Driving	5,516	5,638	+121 (+2.2)	+366 (+6.6)	-48 (-0.9)	-196 (-3.6)
Picnicking	4,741	4,907	+66 (+1.4)	+315 (+6.6)	-187 (-3.9)	-62 (-1.3)
Nature study	2,490	2,493	+3 (+0.1)	+165 (+6.6)	-50 (-2.0)	-112 (-4.5)
Fishing	2,457	2,395	-61 (-2.5)	+163 (+6.6)	-82 (-3.3)	-142 (-5.8)
Ice fishing	194	176	-18 (-9.3)	+13 (+6.6)	-4 (-1.8)	-27 (-14.1)
X-country skiing	560	476	-84 (-15.1)	+37 (+6.6)	-65 (-11.6)	-56 (-10.1)
Downhill skiing	844	698	-146 (-17.3)	+56 (+6.6)	-132 (-15.6)	-70 (-8.3)
Ice skating	912	766	-146 (-16.0)	+60 (+6.6)	-121 (-13.2)	-86 (-9.3)
Pool swim	3,994	3,642	-352 (-8.8)	+265 (+6.6)	-442 (-11.1)	-175 (-4.4)
Other swim	2,365	2,107	-259 (-10.9)	+157 (+6.6)	-246 (-10.4)	-169 (-7.2)
Water skiing	991	787	-205 (-20.6)	+66 (+6.6)	-177 (-17.8)	-94 (-9.5)
Motor-boating	2,104	1,887	-217 (-10.3)	+140 (+6.6)	-140 (-6.7)	-216 (-10.3)
Sailing	701	645	-56 (-8.0)	+47 (+6.6)	-55 (-7.8)	-48 (-6.8)
Canoeing	845	764	-82 (-9.7)	+56 (+6.6)	-91 (-10.7)	-47 (-5.6)
Backpack-ing	330	295	-35 (-10.6)	+22 (+6.6)	-44 (-13.2)	-13 (-3.9)
Hiking	1181	1066	-115 (-9.7)	+78 (+6.6)	-132 (-11.1)	-62 (-5.2)
Tent camp	1147	1018	-128 (-11.2)	+76 (+6.6)	-153 (-13.3)	-52 (-4.5)
Vehicle camping	616	601	-15 (-2.4)	+41 (+6.6)	-1 (-0.2)	-55 (-8.9)
Golfing	2,036	1,875	-160 (-7.9)	+135 (+6.6)	-138 (-6.8)	-157 (-7.7)
Tennis	1,742	1,629	-114 (-6.5)	+116 (+6.6)	-236 (-13.6)	+7 (+0.4)
Soft/ baseball	2,565	2,304	-261 (-10.2)	+170 (+6.6)	-464 (-18.1)	+33 (+1.3)
Basketball	1,663	1,535	-128 (-7.7)	+110 (+6.6)	-252 (-15.2)	+14 (+0.8)
Soccer	412	345	-66 (-16.0)	+27 (+6.6)	-60 (-14.7)	-33 (-8.0)
Bicycling	3,970	3,715	-255 (-6.4)	+263 (+6.6)	-477 (-12.0)	-42 (-1.1)
Horse riding	859	751	-108 (-12.5)	+57 (+6.6)	-177 (-20.6)	+12 (+1.4)
Snow-mobiling	401	320	-80 (-20.1)	+27 (+6.6)	-66 (-16.5)	-41 (-10.2)
Off-road vehicles	809	706	-103 (-12.7)	+54 (+6.6)	-114 (-14.1)	-42 (-5.2)
Hunting	525	488	-37 (-7.0)	+35 (+6.6)	-34 (-6.4)	-38 (-7.2)
Trapping	49	40	-9 (-17.9)	+3 (+6.6)	-10 (-20.4)	-2 (-4.2)

1. (x.x) = percent of 1990 participation.

Table 2. Predicted changes in the number of participants in outdoor recreation activities in Illinois between 1990 and 2025, by race.

Predicted change in the number of participants age 15 and above (in thousands)[1]		Components of change in participation 1990-2025 (in thousands)		
Activity	Change 1990-2025[2]	White	Black	Other
Run/jog	-216 (-7.9)	-358	+72	+70
Walking	+242 (+3.8)	-267	+236	+272
Driving	+121 (+2.2)	-282	+149	+254
Picnicking	+66 (+1.4)	-327	+150	+243
Nature study	+3 (+0.1)	-146	+62	+88
Fishing	-61 (-2.5)	-221	+67	+92
Ice fishing	-18 (-9.3)	-30	0	+12
X-country skiing	-84 (-15.1)	-90	+2	+3
Downhill skiing	-146 (-17.3)	-168	-2	+25
Ice skating	-146 (-16.0)	-194	+4	+43
Pool swim	-352 (-8.8)	-539	+40	+148
Other swim	-259 (-10.9)	-372	+21	+93
Water skiing	-205 (-20.6)	-218	+1	+12
Motorboating	-217 (-10.3)	-276	+19	+40
Sailing	-56 (-8.0)	-74	+3	+15
Canoeing	-82 (-9.7)	-136	+1	+53
Backpacking	-35 (-10.6)	-53	+2	+16
Hiking	-115 (-9.7)	-155	+4	+36
Tent camping	-128 (-11.2)	-195	+20	+47
Vehicle camping	-15 (-2.4)	-55	+9	+31
Golfing	-160 (-7.9)	-252	+21	+71
Tennis	-114 (-6.5)	-259	+26	+118
Soft/baseball	-261 (-10.2)	-420	+40	+118
Basketball	-128 (-7.7)	-252	+31	+94
Soccer	-66 (-16.0)	-85	-1	+19
Bicycling	-255 (-6.4)	-481	+86	+140
Horse riding	-108 (-12.5)	-132	+15	+10
Snowmobiling	-80 (-20.1)	-87	0	+7
Off-road vehicle	-103 (-12.7)	-139	+10	+26
Hunting	-37 (-7.0)	-67	+27	+3
Trapping	-9 (-17.9)	-9	0	0

1 Predictions are made from population projections provided by the Illinois Bureau of the Budget, and per capita participation rates for outdoor recreation activities derived from data provided by the Illinois Department of Conservation. Recreation participation data were available for Hispanic and Asian groups; but population estimates were not available for these groups so they were put in the "other" category.

2 (x.x) = percent change in estimated number of participants 1990-2025.

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THE OUTDOOR SITUATIONAL FEAR INVENTORY: A NEWER MEASURE OF AN OLDER INSTRUMENT

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This study examined the relationship of two methods of scaling the Outdoor Situational Fear Inventory-- continuum scaling and the more easily scored certainty method of scaling. Although item-by-item correlations varied widley, overall and subscale score relationships were strong. The data also suggested ways to clarify interpretations of earlier continuum scaled OSFI scores.

Introduction

Whether using fear to stimulate learning or using instruction to reduce fears, most outdoor pursuits educators are familiar with the positive and negative impacts of students' fears. Those studying the dynamics of fear in outdoor recreation experiences and environments have most frequently used an Outdoor Situational Fear Inventory (OSFI) to identify, describe, and measure changes in the fears of participants of outdoor recreation. Drawing from the literature of other disciplines, Ewert (1988, 1989) developed the original "situational fear inventory" to measure and describe social-based fears and physical- or environment- based fears of outdoor pursuits participants. After extensive use in studies with Outward Bound students and with input from researchers, outdoor instructors, and psychologists, the OSFI was revised for use in new studies of students in a college-sponsored outdoor education practicum (Ewert and Young 1992; Young and Ewert 1992).

Having an overall reliability, as measured by Cronbach's alpha, of .94 (Ewert 1986), the OSFI and its associated research have been useful contributions to the work of researchers and practitioners alike. Nevertheless, important concerns and sug gestions regarding its scaling have been expressed. The OSFI uses a "continuum scaling" method. Along a 10 centimeter line, anchored by the statements "not at all anxious" and "very anxious," subjects are to place a slash mark "at the point that best represents [their] level of concern for each item" (Ewert and Young, undated). Responses to each item on the instrument are literally measured, using a ruler. A portion of the OSFI is illustrated in Figure 1.

Directions: All of us experience different types of anxieties in the outdoor environment. Place a slash (/) on each line at the point that best represents your level of concern for each item. There are no right or wrong answers. Consider the following example:

	▯NOT AT ALL ANXIOUS	VERY ANXIOUS▯
LIGHTNING	|	|

	▯NOT AT ALL ANXIOUS	VERY ANXIOUS▯
BEING HURT OR INJURED	|	|
UNABLE TO CONTROL PHYSICAL ENVIRONMENT	|	|
UNABLE TO CONTROL SOCIAL ENVIRONMENT	|	|
EXPOSURE TO UNEXPECTED SITUATIONS	|	|
MAKING WRONG DECISIONS	|	|
LETTING MYSELF DOWN	|	|
LETTING OTHERS DOWN	|	|
TASK TOO DEMANDING	|	|
NOT HAVING ENOUGH PHYSICAL STRENGTH	|	|
NOT HAVING ENOUGH PERSONAL ABILITY	|	|
FALLING/SLIPPING	|	|

Figure 1. Excerpt from the continuum-scaled OSFI (not to scale).

The continuum-scaled OSFI poses several difficulties. First, the continuum scale is labor-intensive to measure. Thirty-three ruler measurements are made on each instrument. Second, continuum scaling scores may create an artificial sense of precision. For example, if a respondent felt an identical level of fear about "being hurt or injured" (item 1) and "falling/slipping" (item 11), the respondent is unlikely to draw the slash mark at exactly the same point on the continuum. OSFI item scores may range from 0 to 100, but some variations in scores may reflect respondents' imprecise markings more than the instrument's measurement sensitivity. Third, and most troublesome, OSFI continuum scores are difficult to describe. At what point along the continuum between "not at all anxious" and "very anxious" do students' levels of fear become noteworthy? In previous research, rarely have any mean OSFI items scores been above 50. Somewhat arbitrarily, Young and Ewert (1992) have regarded scores over 40 as "elevated."

To ameliorate these difficulties, Young, Quinn, and Steele (in press) modified the OSFI by substituting certainty scaling (Warren, Klonglan, and Sabri 1969) for continuum scaling. This method requires subjects to make two decisions. First, subjects indicate whether they agree or disagree with a statement (e.g., "I am anxious or fearful about lightning") by circling the "A" or the "D" on the instrument. Second, subjects circle a number between 1 and 5 to indicate the strength of their agreement or disagreement. Numerical values ranging from 1 to 10 are then assigned to the responses (D5 = 1; A5 = 10). This OSFI with certainty scaling has a Cronbach's alpha of .93.

I am fearful or anxious about...

Lightning ---------- A / D 1 2 3 4 5

Figure 2. Sample OSFI item using certainty scaling.

Purpose

The purpose of this study was to see if the more descriptive certainty-scaled OSFI could be used to shed new light on the less descriptive continuum scores. Toward that goal, this study first sought to describe the relationship between certainty-scaled and continuum-scaled OSFI item scores. Second, by using the "agree" or "disagree" element of the certainty-scaled instrument to form groups, the researchers could describe and compare the means and distributions of continuum-scaled OSFI item scores of subjects who, on the other form, did or did not acknowledge being fearful about the item. Doing so might provide better basis for estimating the beginning point on the continuum scale where scores reflect subjects being fearful.

Review of Literature

Fearful situations, both real and imagined, are strongly associated with being in wilderness and other primitive outdoor settings. Nash (1982) points out that even among wilderness devotees of recent times, ambivalence and anxiety recur. Ewert (1989b) notes that because risk and fear are fundamentally part of all human experience, they are also part of all outdoor experiences. He adds, however, that outdoor leaders must anticipate students' fears because "if ignored and permitted to reach dangerous levels, they can have a kind of paralyzing effect that is counterproductive from a teaching and learning perspective" (p. 44). Ironically, prior to the aforementioned studies by Ewert (1986, 1988) and Ewert and Young (1992), little was done to identify and describe the fears of outdoor program participants.

Fear is generally seen as a range of feelings from mild apprehension to panic that are associated with perceived threats, which are sometimes specific and tangible and other times elusive and indiscernible (Hauck 1975; Leary 1983). While some fears are instinctual or reflexive (e.g., a sudden clap of thunder), others are learned (e.g., not meeting group expectations) (Schacter and Singer 1962; Rachman 1974; Ewert 1988). People have been found to have a dispositional level fear called "trait anxiety," which is resistant to change (Spielberger 1966). In contrast, "state anxiety" refers to fears arising in response to specific events and contexts (Zuckerman 1976).

A variety of instruments that measure anxiety are described in the psychological literature. Most of these instruments rely on direct observations of subjects, physiological responses, or self-report questionnaires. Noting an imperfect relationship among systems of measurement, Rachman (1978) suggests avoiding reliance upon a single measure. Still, Rachman (1978) argues that self-reported indices of perceived fear provide a practical method of making preliminary estimations of subjects' fears. He states that "...self reporting of fear is indispensable and at the same time potentially misleading" (p. 23). Because research on situational fears of outdoor program participants is in its infancy, single instrument studies are necessary until various forms of measurement are developed, refined, and validated.

The certainty method of scaling was developed by Warren, Klonglan, and Sabri (1969) in an attempt to reduce measurement errors in sociological research. The researchers conducted a study comparing and contrasting conventional types of Likert scaling with certainty scaling formats similar to that depicted in Figure 2. The certainty method was deemed reliable and favored because it achieved the measurement sensitivity of an eleven point Likert scale in a format subjects and researchers preferred.

Although the original certainty method incorporated a neutral or undecided response option, instructions in this study called for a forced-choice because of the nature of the anxiety construct. Leovinger (1977) reports that people are rarely devoid of an attitude. Given the personal nature of fears and anxieties, it was believed that providing a neutral response option would too often furnish subjects with an opportunity to choose a "safe" or socially acceptable response when they did in fact have a directional feeling, however slight, about the items.

Methods

Over an entire season, 162 participants in a college outdoor/adventure program completed the continuum-scaled and the certainty-scaled versions of the OSFI on the first day of their two-week courses. Sequence effects were controlled by randomly assigning students to groups that would complete the instruments in opposite order in separate locations.

Because the certainty-scaled OSFI yields scores between 1 and 10 with a definite beginning point for being fearful (i.e., >- 6), a strong correlation (Pearson *r*) between certainty-scaled scores and continuum-scaled scores would permit a simple way of clarifying the degree of fear represented by continuum-scaled scores.

The "agree/disagree" nature of the certainty-scaled OSFI also permitted the formation of two groups for each OSFI item-- (1) those who "agreed" or were fearful about the item and (2) those who "disagreed" or were not fearful of the item. Forming these groups enabled a first-time examination of frequency distributions and other descriptive statistics of the continuum-scaled item scores of for fearful and nonfearful subjects.

Findings

Overall scores from the two versions of the instrument were strongly related ($r = .77$, $p < .001$). As seen in Table 1, item-by-item correlations ranged from a weak .394 to a strong .782 and were all significant at the .001 level.

Table 1. Item-by-item correlations of certainty-scaled and continuum-scaled Outdoor Situational Fear Inventories.

Item	r[a]
Being hurt or injured	.664
Unable to control physical environment	.569
Unable to control social environment	.560
Exposure to unexpected situations	.419
Making wrong decisions	.523
Letting myself down	.637
Letting others down	.644
Task too demanding	.456
Not having enough physical strength	.782
Not having enough personal ability	.582
Falling or slipping	.658
Confrontation with others	.599
Going unrecognized in the group	.618
Not performing up to group expectations	.548
Not fitting in with the group	.672
Not performing up to leader expectations	.648
Being sexually harassed	.680
Bad Weather	.693
Poisonous plants	.759
Poisonous snakes	.758
Darkness	.683
Dangerous animals	.738
Being bothered by insects	.656
Becoming sick	.656
Fast or deep water	.701
Becoming lost	.610
Getting dirty	.462
Inadequate clothing	.394
Not enough training	.616
Insufficient food	.654
Course not meeting my expectations	.480
Not getting my money's worth	.708
Hot or cold temperatures	.637

[a] $p < .001$ for all items.

Tables 2 and 3 show descriptive statistics of the fearful and nonfearful groups' continuum OSFI scores for social-based fears and physical-based fears respectively. Examining those tables, one observes that in every instance the means of fearful and nonfearful groups differed by an average of 30 points. Striking is the fact that the minimum scores of both fearful and nonfearful groups were almost always less than 10 and the maximum, almost always over 80.

Without showing histograms for all 33 items, one effective way to compare the distributions of fearful and nonfearful groups' scores is to examine quartile distributions. Included in Tables 2 and 3 are the 25th, 50th, and 75th percentile scores of each group for each item. The average quartile distributions of each group for social-based, physical-based, and all OSFI items are shown in Table 4. The emerging pattern, high-lighted Table 4, is that 75% of fearful subjects have continuum OSFI scores above 30. Likewise, 75% of nonfearful subjects have continuum scores below 30. These figures might suggest that the earlier decision to regard scores above 40 as "elevated" (Ewert and Young 1991) should be revised to a score of 30.

Table 2. Description of fearful and non-fearful groups' social-based continuum-scaled OSFI scores.

Expressed Fear	Group	n	Mean	S.D.	Percentile 25th	50th	75th	Min.	Max.
Unable to Control Social Environment	Fearful	59	47.5	28.8	25	46	66	2	97
	Non-fearful	102	22.4	16.2	9	20	29	0	68
Exposure to Unexpected Situations	Fearful	60	48.6	21.8	33	50	65	2	95
	Non-fearful	100	29.1	20.8	14	22	44	0	95
Making Wrong Decisions	Fearful	76	48.9	20.6	33	49	64	2	94
	Non-fearful	85	27.1	16.1	13	26	41	0	65
Letting Self Down	Fearful	64	51.8	24.5	31	51	72	1	95
	Non-fearful	97	23.9	18.7	11	18	33	0	86
Letting Others Down	Fearful	83	59.1	23.5	41	61	78	1	97
	Non-fearful	77	25.5	17.2	12	20	42	0	68
Task Too Demanding	Fearful	42	48.5	21.7	31	51	64	10	96
	Non-fearful	119	26.9	17.6	12	24	41	0	79
Confrontation With Others	Fearful	26	48.2	22.0	33	49	66	3	84
	Non-fearful	135	20.1	17.3	8	15	26	0	84
Going Unrecognized in Group	Fearful	40	48.8	24.3	28	50	64	6	93
	Non-fearful	121	19.7	15.5	8	15	29	0	70
Not Performing Up to Group Expectations	Fearful	66	49.6	24.5	27	49	72	4	98
	Non-fearful	95	24.1	19.1	11	19	32	0	82
Not Fitting In With Group	Fearful	57	51.9	25.1	35	56	71	5	97
	Non-fearful	102	19.1	15.5	9	14	26	0	76
Not Performing Up to Leader Expectations	Fearful	74	51.3	23.5	33	51	70	6	96
	Non-fearful	86	20.3	15.7	9	16	28	0	68
Being Sexually Harassed	Fearful	15	51.4	29.8	24	52	73	2	96
	Non-fearful	146	10.5	15.0	2	5	12	0	96
Not Getting Money's Worth	Fearful	24	61.4	26.0	40	64	84	16	96
	Non-fearful	134	16.4	16.5	6	10	24	0	92
Course Not Metting Expectations	Fearful	27	46.6	24.5	23	48	66	4	92
	Non-fearful	130	19.6	17.8	6	14	28	0	94
Mean of Social Fears Items	Fearful	50.9	51.0	24.3	31.2	51.9	69.6	4.6	94.7
	Non-fearful	109.2	21.8	17.1	9.3	17.0	31.0	0.0	80.2

Table 3. Description of fearful and non-fearful groups' physical-based continnum-scaled OSFI scores.

Expressed Fear	Group	n	Mean	S.D.	Percentile 25th	50th	75th	Min.	Max.
Unable to Control Physical Environment	Fearful	64	47.3	24.6	24	48	62	3	96
	Non-fearful	97	25.8	19.6	13	20	31	0	85
Bad Weather	Fearful	64	54.7	25.4	36	59	76	4	93
	Non-fearful	96	21.8	19.2	8	18	30	0	90
Being Hurt or Injured	Fearful	62	54.2	24.1	31	58	74	3	94
	Non-fearful	99	21.3	16.2	11	17	26	0	84
Poisonous Plants	Fearful	63	53.8	27.6	33	53	78	0	98
	Non-fearful	98	17.4	14.4	7	15	24	0	75
Poisonous Snakes	Fearful	87	64.0	27.6	41	73	87	0	99
	Non-fearful	74	18.8	16.5	6	13	28	0	80
Darkness	Fearful	21	57.7	22.9	47	54	75	8	97
	Non-fearful	140	17.4	18.5	4	11	24	0	91
Dangerous Animals	Fearful	72	59.3	25.6	42	63	83	0	98
	Non-fearful	89	18.3	18.2	5	13	21	0	74
Bothered by Insects	Fearful	98	53.6	25.3	37	56	71	0	99
	Non-fearful	60	20.0	17.7	6	18	27	0	82
Becoming Sick	Fearful	57	47.9	26.2	27	45	69	0	98
	Non-fearful	100	19.5	16.6	6	17	30	0	64
Fast of Deep Water	Fearful	46	53.3	22.6	42	54	70	2	98
	Non-fearful	112	18.7	17.0	5	15	27	0	94
Becoming Lost	Fearful	58	50.4	23.2	34	50	68	0	98
	Non-fearful	100	22.2	19.9	6	18	34	0	83
Getting Dirty	Fearful	17	37.9	28.3	13	43	53	1	98
	Non-fearful	140	12.6	17.0	3	7	16	0	92
Inadequate Clothing	Fearful	61	42.8	24.0	22	40	75	0	97
	Non-fearful	97	22.2	20.0	8	16	34	0	90
Not Enough Training	Fearful	56	50.4	23.7	33	48	70	0	98
	Non-fearful	102	22.6	18.7	8	19	32	0	90
Insufficient Food	Fearful	51	47.4	27.2	25	46	69	0	100
	Non-fearful	107	17.6	17.3	5	12	25	0	92
Cold/Hot Temperatures	Fearful	56	46.7	24.6	26	45	63	4	98
	Non-fearful	102	18.1	17.1	6	13	26	0	95
Mean of Physical Fears Items	Fearful58.3	51.3	2	5.2	32.0	52.0	71.4	1.6	97.4
	Non-fearful	100.8	19.6	17.8	6.7	6.0	27.1	0.0	85.1

Table 4. Averages of descriptive statistics of fearful and non-fearful groups' continuum-scaled OSFI scores.

Expressed Fear	Group	n	Mean	S.D.	Percentile 25th	50th	75th	Min.	Max.
Means for All Social Fears	Fearful	51	51.0	24.3	31	62	70	5	95
	Non-fearful	109	21.8	17.1	9	17	31	0	80
Means for All Physical Fears	Fearful	58	51.3	25.2	32	52	71	2	97
	Non-fearful	101	19.6	17.8	7	15	27	0	85
Mean for all SFI Items	Fearful	54.0	51.2	24.8	31.7	52.0	70.6	3.0	96.2
	Non-fearful	1004.0	20.6	17.4	7.9	16.9	28.9	0.0	82.0

Still, the temptation to use any continuum OSFI score to designate subjects as "fearful" should be approached cautiously. Not only is there considerable overlap in the distributions of fearful and nonfearful groups, there is also a difference in the size of these groups. On average, 34% of subjects comprised the "actually fearful" group (i.e., subjects who "agreed" that they were fearful or anxious about the item). In Table 5, by cross-tabulating the percentages of "apparently fearful" (i.e., OSFI >30) and "apparently nonfearful" (i.e., OSFI < 30) with those of the "actually fearful" and "actually nonfearful," one sees groups formed by continuum OSFI figures will exaggerate the percentage of fearful subjects.

Table 5. Percentages of fearful and nonfearful subjects based on continuum-scaling estimates and actual self-reports.

	Continuum OSFI Score Estimates		
Actually	Fearful (Above 30)	Nonfearful (Below 30)	Total
Fearful	25.5%	8.5%	34%
Nonfearful	16.5%	49.5%	66%
Total	42.0%	58.0%	100%

Conclusions

On an item-by-item basis, continuum-scaled and certainty-scaled OSFI scores are often not strong predictors of one another. In instances where the relationships are strong, one might reinterpret continuum scores in light of their relationships to certainty score descriptors.

As reflected by the overlapping continuum-scaled OSFI scores of those who fear and do not fear a given situation, the continuum scaling of OSFI items does not present a clear beginning point for those who are fearful. Nevertheless, when using the continuum-scaled OSFI in future studies or in reinterpreting findings of earlier studies, one might use with caution the quartile distributions presented here to provide a better basis for estimating what constitutes an elevated score.

Despite its usefulness and reliability in depicting patterns and changes of situational fears for groups, the continuum-scaled OSFI remains difficult to interpret. The continuum scale is viewed too differently by individual subjects to permit firm descriptors to be attached to its OSFI scores. Further, the continuum-scaled OSFI does not permit accurate separation of fearful and nonfearful subjects into discrete groups. The certainty-scaled OSFI or a continuum-scale OSFI with clearer end- and mid- points may represent more promising and informative approaches to studying persons' fears about outdoor experiences.

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REGIONAL TRADE MARKET ANALYSIS:

RESORT MARKETING APPROACHES

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This paper examines the value of geographic segmentation for a regional ski resort in New England. Customers from different user groups were surveyed along with a list of inquiries and a purchased list, and grouped according to their area of origin. An ANOVA was performed to determine if there were differences in attitudes and trip behaviors between the segments. It was concluded that geographic segmentation offers good insight into market potential and service design.

Keywords: marketing, segmentation, resorts, geographic segmentation, skiing, regional market analysis.

Introduction

There are many public and private resorts throughout the world that compete on regional, national and international levels. It is important for these resorts to determine their respective trading areas so they can identify the competition and determine the proper marketing strategies. For example, a resort in New England should know whether it is competing only with the other resorts in the area or with resorts throughout the country, or even the world. Many family resorts find themselves competing with DisneyWorld in Orlando, Florida no matter where they are located. Identifying a resort's trading area includes the identification of the target market profile and information on trip behavior. These additional characteristics will enable the resort to determine the mobility of the target market, and the likelihood that members of that market would travel outside the region.

The proper identification of a resort's trading area would also provide the firm with the ability to enlarge its market by tapping some of the areas that show potential. That is, the resort may notice that there is a segment of customers that visit from a geographic region that is not a major focus of its marketing program. As a result, more resources could be used to target that market in the event that other, perhaps closer, markets are becoming saturated. However, marketing research is necessary in order to determine the particular wants and needs of the travelers in these untapped markets. It could be a big mistake to use the same marketing program to attract all market segments.

Background

Market segmentation is an important element of marketing strategy. Segmentation is the process of dividing large heterogeneous populations into smaller homogeneous subsets. This strategy allows a firm to choose the subsets, or target markets, that best fit the organization's goals and products/services by developing an appropriate marketing mix for each segment. Certain criteria must be met in order for segmentation to be an effective strategy (Mason and Ezell 1993):

1) differential response - segments should respond differently to some aspect(s) of the marketing strategy,
2) substantiality - the size of the segment must be large enough to warrant special attention,
3) measurability - segments must be identifiable and measurable in numbers and in purchasing power,
4) accessibility - it must be possible to reach the segments with the promotion mix, and
5) reliability - segments should exhibit adequate stability over time.

If any of these criteria are not met, then it is not advisable for the firm to use a segmentation strategy .

Segmentation strategies are particularly helpful in the travel industry (Bojanic 1992; Javalgi, Thomas & Rao 1992; Showmaker 1994). There are five basic methods that can be used by marketing managers to segment consumer markets (Reid 1989). These methods can be categorized as geographic, demographic, psychographic, behavioral, and benefit segmentation. However, there is some debate as to whether hotels are putting too much emphasis on market segmentation rather than using a mass marketing approach (Del Rosso 1992). It is argued that segmentation is a less efficient and, in some cases, less effective approach to marketing. However, ski resorts still rely heavily on market segmentation as a means to optimize the use of resources and maximize sales and revenues (Waldrop 1991).

Geographic segmentation is very popular and efficient in the tourism and hospitality industries because geographic sub-markets exist in most countries (Garreau 1981; VanHove 1989). The most popular forms of geographic segmentation are: regions; population size of cities, counties or states; population density; and climate. It is very common in tourism and travel to concentrate marketing efforts in a few geographical markets rather than to spread resources into many countries and/or regions. According to VanHove (1989), the two most important variables for geographic segmentation are the regional breakdown and the city size or degree of urbanization of a population.

Regional marketing focuses not only on the shifting of consumers geographically, but also on the differences in their product preferences based on where they live. The goal is to develop marketing plans to reflect specific area differences in taste preferences, perceived needs, or interests. For example, segmenting a hotel's market based on zip code origin of the guests is a very useful way to identify those areas that deserve the heaviest concentration of marketing resources. The geographic segmentation, or trading area analysis, could be coupled with a survey of attitudes, interests and opinions of the consumers so that a marketing program can be developed for each target market.

Ski resorts tend to have two basic markets: day use guests and overnight guests. It is important for the resort to manage the customer mix so that it can benefit from the daily frequency of day use guests as well as the greater profit potential from overnight guests. Day use guests will tend to be the local market and the overnight guests come from regional and national/international markets. New England ski resorts seem to draw most of their market share for overnight guests from regional markets (Anonymous 1992; Beilinson 1993).

Purpose of the Study

The purpose of this study is to utilize this approach for a resort to determine its ability to effectively segment the market. First, consumers will be segmented into geographic regions based on the state and/or country of origin. Zip codes would provide more detailed information that would be useful in targeting promotions but the size of the sample requires aggregation for analysis purposes. The next step is to evaluate consumer differences between regions based on demographics, psychographics and attitudes/preferences. As a result, the resort can consider various growth strategies and evaluate them on their merits.

Methods

The firm used in this study is a ski resort in New England. The resort is known for its exceptional family programs. The sample for the study consisted of three major groups: 1) past guests of the resort, 2) people who inquired about the resort, and 3) names obtained from a purchased list of potential ski enthusiasts. The sampling frame used for the study was the resort's entire database of customers, inquiries for the past three years, and names on a purchase list of potential skiers acquired from a regional direct mail dealer. This resulted in a total of approximately 23,000 households from throughout the United States and Canada. The entire population was included in the survey and had the opportunity to respond.

The respondents were mailed a self-administered questionnaire that covered current programs and tested ideas and concepts for new programs. In addition, the questionnaire had a detailed section for gathering information on the demographics of the sample. The geographic segmentation was done by state where there was adequate density, and then by U. S. regions (other New England, Mid-Atlantic and other U.S.) and a segment for Canadians. The states that were worthy of separate treatment were: Connecticut, Massachusetts, New Jersey and New York. This resulted in eight separate geographic regions. The breakdown by region is presented in Figure 1.

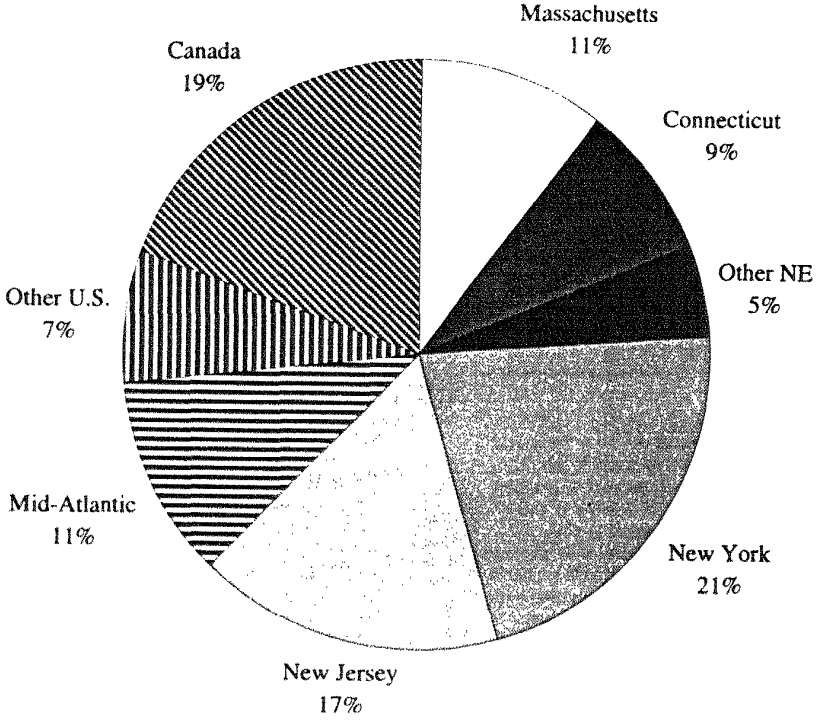


Figure 1. Sample distribution by region.

The overall response rate for the survey was approximately 20%, however, it varied by segment from the mid-teens for the purchase list to the upper twenties for the past guests. The analysis by geographic region included the 2,981 respondents out of the 4,400 total respondents who provided addresses (which were optional but necessary for the drawing for a free weekend incentive). The profiles of the respondents based on demographics and geographic region were compared with the records maintained by the resort and it was concluded that they were not significantly different. Therefore, nonresponse bias should not be a major problem.

Results

The results of the survey can be grouped into four major categories: 1) basic programs and activities, 2) fitness and exercise facilities, 3) lodging facilities, and 4) skiing activities and facilities. Mean ratings of preferences for programs, amenities and services were obtained for each of the geographic regions and then tested for statistical significance using analysis of variance (ANOVA). The ANOVA results were further analyzed using the Duncan mean separation test to determine which means were significantly different from which other means. All of the results for the study appear in Table 1.

Basic Programs and Activities

One of the significant findings in this section was that respondents from the "Other U.S." region tended to rate the children's programs lower than the other regions but rated the other activities relatively high. The respondents from the "New England" region rated dining options and shopping relatively low compared with other regions. The "Canada" region tended to rate nonski activities lower than most other regions. Overall, the most distinguishing attributes in this section were children's programs and dining options.

Fitness and Exercise Facilities

The most important attributes in this section were pool facilities and hot tub/spa. In fact, the pool and hot tub facilities rated third and fourth, respectively, in terms of overall importance. The "Canada" region rated the pool and tennis facilities higher than most of the other regions. Respondents from the "Other U.S." region tended to rate most of these activities low. This would seem to indicate that they are most concerned about skiing rather than nonskiing activities when vacationing in the winter.

Table 1. Ratings by region of resort attributes.

Attribute	Massachusetts	Connecticut	Other NE	New York	New Jersey	Mid-Atlantic	Other U.S.	Canada	F
Children's Programs	5.21	5.20	5.06	5.13	5.30	4.93	4.62	4.90	2.74*
Dining Options	5.07	4.99	4.94	5.31	5.27	5.19	5.25	5.21	2.60*
Night life	4.16	4.16	4.12	4.33	4.22	4.14	4.35	4.18	0.94
Nonski Activities	4.60	4.39	4.43	4.51	4.53	4.29	4.52	4.23	2.93*
Shopping	3.66	3.59	3.44	3.82	3.73	3.68	4.15	3.96	4.15*
Spa/Hot Tub	5.46	5.49	5.52	5.54	5.50	5.50	5.47	5.40	0.39
Ice Skating	4.87	4.96	4.89	4.66	4.88	4.53	4.25	4.29	8.79*
Pool	6.03	5.97	6.20	5.99	5.88	5.70	5.36	6.01	8.87*
Tennis	3.49	3.50	3.39	3.70	3.61	3.26	2.96	3.59	4.10*
Fitness	4.24	4.21	4.25	4.39	4.38	4.12	4.08	3.93	3.35*
Maid	4.79	5.10	4.78	5.33	5.21	4.94	5.19	4.93	5.11*
Dormitories	2.05	2.16	1.94	2.22	2.08	2.10	2.24	2.24	1.21
Hotel	4.55	4.55	4.34	4.95	4.62	4.58	4.77	4.49	3.96*
Condominiums	6.40	6.37	6.46	6.23	6.42	6.26	6.23	6.25	2.41*
Motel	3.73	3.69	3.57	3.86	3.42	3.69	3.73	3.80	2.61*
Access to Slopes	4.68	4.75	4.70	4.81	4.95	5.12	5.34	5.09	5.61*
Evening Skiing	4.31	4.68	4.33	4.42	4.36	4.58	4.87	4.81	4.86*
Quality Ski Conditions	6.49	6.49	6.55	6.42	6.51	6.50	6.20	6.54	3.38*
Adult Lessons	4.33	4.42	4.09	4.58	4.65	4.22	4.39	4.85	5.01*
Children's Lessons	5.26	5.09	4.90	5.19	5.25	4.83	4.54	5.04	3.41*
Total Budget	$1,530	$1,700	$1,545	$1,825	$1,935	$1,945	$2,185	$1,915	7.44*
Number of Vacations	2.15	2.08	2.33	2.28	2.22	2.13	1.98	2.15	0.85
Number of Children	1.85	1.95	1.94	1.73	1.89	1.73	1.45	1.71	4.77*
Sample Size	314	256	146	647	492	334	213	579	2,981

scale: 7="extremely appealing" to 1="not at all appealing"
* significant at the .05 level.

Lodging Facilities
Condominiums were rated as the most important type of lodging facility for the overall sample, and it was rated as the second highest of all the attributes in terms of importance. The least preferred type of lodging was the dormitory style. The "Canada" region and most of the New England regions rate maid service and hotels relatively low. In contrast, the "New York" and "Other U.S." region tend to rate hotels and motels higher than the rest of the sample.

Skiing Activities and Facilities
This is the most important section of attributes because the main purpose of the vacation destination choice is to ski. The most important skiing attribute was having quality skiing conditions. In fact, this attribute was rated as having the most importance in choosing a vacation destination. The "Massachusetts" and "New Jersey" regions rate the children's ski lessons higher in importance than the other regions. The "Massachusetts" and "Other New England" regions also rate adult ski lessons, access to slopes, and evening skiing relatively lower than the other regions. This is probably due to the fact that most of the respondents in these regions ski with some regularity and are not as concerned about attributes relating to extra ski time and improving adult skiing ability. For example, the "Other U.S." region rates access to slopes and evening skiing relatively high, and lessons and quality of skiing conditions relatively low. Finally, the "Mid-Atlantic" region rates adult and children's

lessons lower than the other regions and tends to rate the other attributes in this section higher than the other regions.

Trip Behavior

The number of ski vacations in a year for the different regions ranged from 1.98 to 2.33. The regions that take ski vacations with the highest frequency are: "other New England" (2.33), "New York" (2.28), and "New Jersey" (2.22). Those regions with the lowest frequency are: "other U.S." (1.98) and "Connecticut" (2.08). The average number of children per region ranged from 1.45 to 1.95. The regions with the highest averages are "Connecticut" (1.95) and "other New England" (1.94). The regions with the lowest averages are "other U.S." (1.45), "Canada" (1.71) and "Mid-Atlantic" (1.73). Finally, Figure 2 illustrates the differences in trip budgets between the regions. Those regions further away tend to have higher budgets for skiing vacations, primarily due to transportation costs and length of stay.

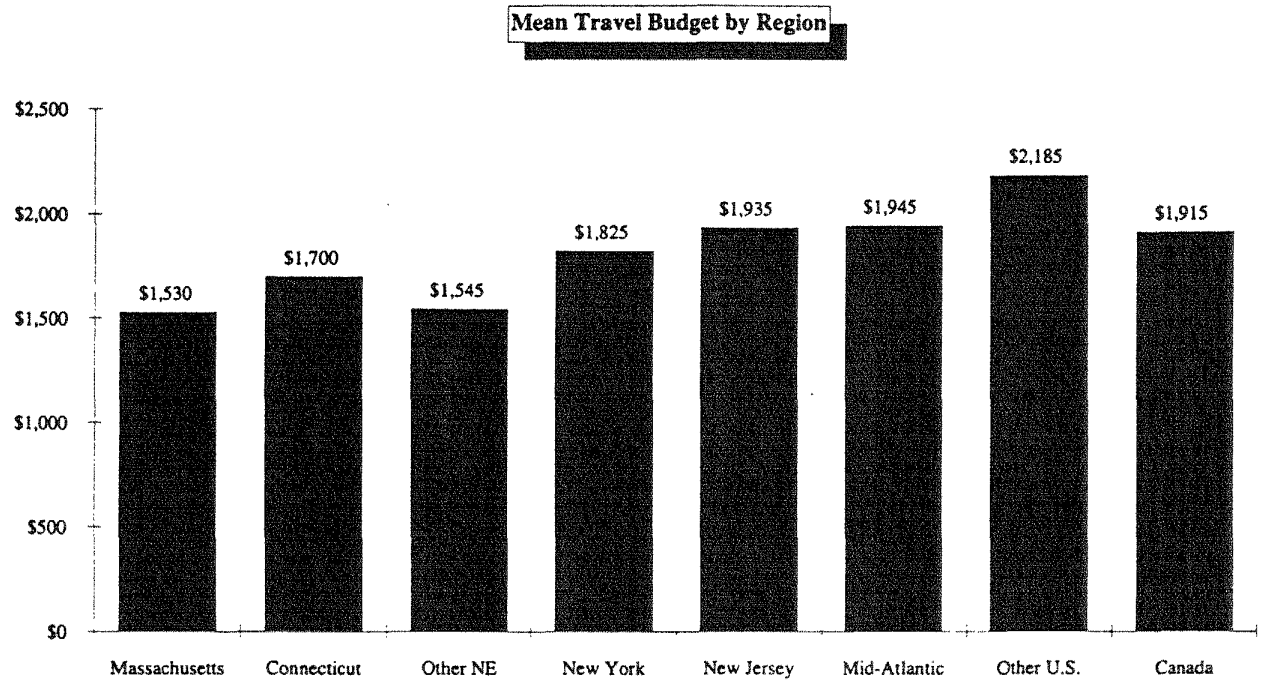


Figure 2. Mean travel budget by region.

Conclusions

Linking the survey attributes with the geographic regions provided some new insights into the marketing of a resort. The resort has done an excellent job of studying current trends in its markets and predicting future trends. The resort is seen as an innovator in family ski vacations but the other resorts in New England are attempting to copy the successful elements of its programs. Therefore, it is incumbent upon the management of the resort to stay abreast of major trends and changes, and to continually seek to be their first to develop new programs and new markets. Examining new market segmentation approaches and strategies are necessary in order to pursue new markets or refine old market strategies. Linking survey preference information with different geographic markets does show promise.

The findings of the study suggest some areas for future development. The closer markets, or regions, seem to have placed a greater emphasis on the family atmosphere and children's programs. Furthermore, a resort which heavily targets families with young children may find a restrictive geographic market. Families probably prefer to travel only so far with children in tow. Although not reported here, the households' most popular competitive winter vacation options were most highly represented from ski resorts within New England. Conversely, the more distant markets were most concerned about the skiing conditions and the basic accommodations. The resort could "unbundle" its all inclusive package to allow more "a la carte" selections. The major reasons for people not visiting the resort are price and location/distance. Travelers that place less value on family programming can find a more suitable package to fit their needs. However, management must be willing to depart from the current theme of the resort and be prepared to support this decision throughout the long term.

The Canadian market offers strong opportunities for this resort in the future. In general, they are basic skiers looking for a good value. At the present time they are pleased with the package but they must be monitored so that any necessary changes can be implemented in a timely fashion. This would also suggest that the resort develop some type of strategy to "unbundle" the package components at some future date. Many of the other New England resorts are not as familiar with the Canadian market and do not

cater to them the same way as this resort. In some respects, the Canadian market can act as a hedge against adverse economic conditions in the United States.

The trading area for this resort is definitely regional at this point (the Canadian visitors are within a 300-mile radius). That is not to say it will not change in the future, either out of necessity or design. It is important for the resort to decide if it wants to maintain the smaller family atmosphere or "commercialize" like other ski resorts in New England. The resort needs to decide if it can maintain this status with the present offering and the present markets. If growth is a goal of the firm, then it must decide among four major strategies: market penetration, product development, market development and/or diversification. The results of this study are useful in evaluating the first three strategies, especially market development.

In this study only the preferences for programs, amenities and services were addressed by geographic regions. However, additional insights can be gained as suggested by Mason and Ezell (1993) by examining/monitoring: a) the willingness to visit the area or the resort (a measure of likely responsiveness); b) the changing sizes of these different regional markets over time (a measure of sustainability); c) the demographic attributes -- income, education and professional status (a measure of measurability); d) the media preferences or how individuals learned about the attraction or resort (the accessibility measure); and e) the stability of the geographic market segments over time (the reliability measure). Furthermore, a measure of efficiency may be useful by determining the return on investment of geographic segmentation.

There are some limitations associated with this study. As with any sample, there are questions involving response bias and nonresponse bias. However, in this study the sampling frame included a large portion of the overall population and there was a substantially large response pool. These two factors should help to minimize these biases, which were analyzed to some extent by comparing the characteristics of the sample with the characteristics of the population. Nonsampling error could also have occurred as it relates to mail surveys. Respondents were asked to interpret the questionnaire and complete it in an uncontrolled environment. The questionnaire was pretested in order to minimize reliability and validity problems. Finally, the generalizability of a survey can always be questioned. The researchers intended this study to be an example of a procedure that could be used by any firm. The results are only applicable to this particular resort, and to some extent to other ski resorts in New England.

Finally, the linking of other dimensions to geographic segments does show promise here. These dimensions should be helpful to recreation and park resource managers, both public and private, as we enter into a more competitive tourism marketplace. When an agency seeks to expand its market beyond it current regional trade area, it is worthwhile to examine the preferences and differences of more distant markets. Implementation of this approach and careful monitoring over time will help to determine the success of such approaches.

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UNDERSTANDING SEASONAL HOME USE:

A RECOMMENDED RESEARCH AGENDA

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Seasonal homes are a part of many people's recreation and tourism experiences, yet few studies address the choice, characteristics, use, or impacts of seasonal homes. Methodological issues associated with seasonal homes research are discussed, and a study underway in Michigan is described to show how some of these issues can be dealt with.

Introduction

Seasonal homes are a familiar feature of the urban-wildland interface, springing up wherever there are rural, amenity rich areas within a day's drive of a population center. Between 1960 and 1980, all but 9 states recorded a net gain in the number of seasonal housing units (Spotts 1992). But in spite of their importance, visibility, and familiarity, little is known about how seasonal homes are used or the impacts of this use on the local area. Seasonal home use has some characteristics of tourism, in that it involves overnight travel away from home. Seasonal home visitors also make use of local recreation resources, and tend to be familiar enough with the local community that their use patterns and information needs are more like those of local residents than those of other tourists.

Perhaps because seasonal home use has characteristics of both recreation and tourism, neither field has done much research on seasonal homes. Information about seasonal home ownership is very limited, and comes mostly from occasional questions included in studies of other recreation or planning issues. This paper outlines the reasons seasonal home research is needed, the unique characteristics of seasonal homes that make such research difficult, and the methods that might be useful in overcoming these problems. The paper concludes with an example of how research design issues were resolved in a study of seasonal home users currently underway in Michigan.

Seasonal home use has strong links to outdoor recreation activity. Seasonal homes provide overnight lodging for single purpose trips (e.g., to a ski area) while also serving as a base for a variety of resource-based recreation activities. A 1978 study showed that a quarter of all Michigan skiers relied on family-owned seasonal homes for overnight housing during their ski trip (Stynes and Mahoney 1980). The 1980 Michigan Boating Survey found that 30% of registered boat owners also own a seasonal home, and a quarter of all registered boats are kept at seasonal homes (Stynes and Safronoff 1982). The boating study included enough seasonal home owners to identify some patterns of ownership. Young families had the lowest rates of seasonal home ownership, and rates were highest among older families and empty nesters .

Based on the findings from the boating and skiing studies, we speculate that seasonal homes may account for up to a quarter of the outdoor recreational activity in Michigan. Seasonal home ownership also plays an important role in shaping the travel and tourism behavior of seasonal home owners, including travel to and from seasonal homes as well as day trips emanating from a seasonal residence. The financial commitment associated with owning a seasonal home represents one of the biggest recreation/tourism budgeting decisions a household will make. Many subsequent leisure choices may be affected as the seasonal home becomes the primary vacation destination, and spending to furnish and maintain the home precludes other travel or recreation-related purchases.

A Suggested Research Agenda

As with any research topic, seasonal homes research should progress from exploratory to descriptive to explanatory. Seasonal homes research from the late '60's and early '70's provided some exploratory and descriptive information, including patterns of ownership and use for selected areas (Coppock 1977; Marans and Wellman 1976; Ragatz 1969). As this exploratory research is updated, we need to use qualitative approaches to enrich our understanding of behaviors, lifestyles, and meanings associated with seasonal homes.

Future descriptive research should update and expand upon early seasonal homes studies. Generating descriptions of seasonal homes trends and spatial patterns from Census data and other secondary sources would be a good place to start. Land use planners are interested in tenure, land and housing characteristics of seasonal homes, while real estate agents want to better understand the seasonal home choice process. Many business, community service, and recreation and tourism groups are interested in use patterns and needs and wants of seasonal home owners. Further descriptive research on these and other topics in different geographical areas will provide a firmer basis for explanatory and predictive studies.

Explanatory research can help us to understand the spatial, temporal, and activity patterns associated with seasonal homes in order to anticipate future patterns (e.g., Bell 1976; Burby et al. 1972; Tombaugh 1968). Explanatory studies are also crucial in assessing the short and long range social, economic, and environmental impacts of seasonal homes (Gamble et al. 1975; Gartner 1986). Establishing linkages between seasonal homes research and other areas of research, such as retirement migration, recreation, leisure time, travel, land use, and community development is a critical part of seasonal homes research. Existing fields of study such as these will continue to be a major source of theoretical concepts and models, at least until seasonal homes research makes significant progress.

Seasonal homes research topics are many and varied. Four general research themes deserve some attention: 1. seasonal home choice processes; 2. characteristics of seasonal homes/properties; 3. characteristics and behavior patterns of seasonal home owners and users, and 4. impacts of seasonal home properties.

Understanding Seasonal Home Choice

Buying a seasonal home involves a complex, extended decision process which does not resemble the simpler consumer or recreation choices upon which most choice research to date has focused (Stewart 1994). The seasonal home decision provides an opportunity to conduct basic research on long term, complex choice processes. Understanding how people learn about, evaluate, and choose among options can provide new insights into other complex decisions consumers make, and may also shed new light on simple choice processes. Because the seasonal home is not a necessity, the buyer is seldom under time pressure to complete the decision process. This condition, together with the spatial dispersion of the alternatives being considered and the lack of a centralized information source, makes the pace of seasonal home decision making quite slow compared to other decision processes. While decision research rarely includes a temporal component, there is reason to believe that the passage of time does affect decision making (Stewart and Stynes in press). Observing a decision process which occurs slowly allows identification of the sequence of events and potential inter-dependence between time, the decision making environment, and the decision maker.

The seasonal home choice process also highlights the factors that draw buyers to an area. Understanding the buyer's decision process can help real estate agents anticipate problems the buyer may experience at different stages of the decision process, so that s/he can provide the right kind of assistance throughout the buying process.

Seasonal Home Characteristics

Although Census of Housing data provides an estimate of how many seasonal homes there are in a given area, there is seldom any other information available on the characteristics of seasonal properties. Research needs to provide more descriptive information, including structural characteristics (single or multiple unit, winterization), spatial distribution, physical setting (lake, forest), subdivision or association affiliation, ownership type (condominium, timeshare) and so on. The environmental impacts of seasonal properties were a particular concern in the 1970's (e.g., American Society of Planning Officials 1976; Gamble et al. 1975), and can be best understood if the physical characteristics of seasonal properties are known. In the wildland-urban interface where wildfire may be a threat, it is important to assess the structural characteristics, building materials, and lot characteristics (e.g., distance to trees, driveway configuration) to determine what steps could be taken to make a property more defensible in the event of wildfire (Fried 1993). General land use planning, often a contentious process in amenity-rich areas facing development pressures, is also facilitated by information about seasonal home properties.

Understanding Seasonal Home Owners and Users

Seasonal home owners and users represent two population groups with many potential differences. Describing the demographic characteristics of these groups is a necessary precursor to any other seasonal homes research. The motivations for seasonal home ownership or use, the patterns of use, recreation activity patterns, and market area for seasonal home developments should also be addressed.

The attitudes, values, and beliefs of seasonal home owners are often different from those of permanent residents (Marans and Wellman 1978). When a community is seeking the input of its residents, it is important that seasonal residents are systematically included. Seasonal residents' preferences for community services, health care, education, and infrastructure should be considered, and should not be assumed to mirror those of permanent residents (Girard and Gartner 1993).

Public land managers will have contact with seasonal residents in many areas because public lands provide viewsheds, open spaces, and recreational resources that seasonal residents value. Seasonal residents generally have less experience with rural land management practices, do not hold jobs in the local area, and are very concerned about maintaining the recreational and amenity resources, which taken together can make them unsympathetic to extractive uses of natural resources. Their viewpoints may be backed by enough education and experience with policy issues to make them a formidable interest group, whichever side of the land management debate they favor.

Measuring The Impact Of Seasonal Properties

The impacts of general tourism have been of great interest to tourism researchers and local communities, especially regarding how much tourism is "worth" to an area in economic terms. Seasonal visitors bring money into the region, and may spend considerably more, perhaps in less "leaky" sectors, than do short-stay visitors. Groceries, recreational equipment - often including major items such as boats or skis - home furnishings, and home maintenance services are a few of the categories where seasonal residents are quite likely to outspend other tourists. Many of these purchases are made in the local area because the items are specifically designed for the resort area (e.g., "cottage" style furnishings). Others are difficult to transport, making it impractical to bring them from home (e.g., appliances or fresh food). Including seasonal home owners and users in economic impact studies, preferably as a separate segment of visitors, would allow us to refine our understanding of tourism impacts, and to know what kind of impacts a community can expect when much of its tourism activity is generated by seasonal homes (Waters, 1990).

Recreation planners need to know how many people visit the seasonal homes in their area, for how long, and in which seasons of the year. Seasonal home owners and their guests often make use of local recreational facilities and should be included in local recreation needs analyses. The availability of major recreation facilities (e.g., downhill ski areas, golf courses) and amenity natural resources (e.g., forests, streams, and lakes) are important factors in attracting seasonal home buyers to a location (Stewart 1994). Performing a recreation needs analysis that does not include seasonal residents not only undercounts potential users, but also fails to recognize the needs and preferences of a group of tax paying citizens.

Traditional population forecasting methods that rely on permanent resident counts have proven very inaccurate in predicting amenity-related migration. Seasonal home owners often convert their seasonal residence to a permanent retirement home. Research is needed to identify the property types, seasonal home owners or user characteristics, and communities where conversion is most likely. By estimating conversion rates for seasonal home communities and/or housing types and including them in population and economic forecasts, we can better predict future retirement migration in an area.

Social impacts associated with seasonal properties range from seasonal upswings in infrastructure and public service demands to potential for future retirement migration to clashing values and beliefs. Unlike tourists who visit for a short time and then leave, seasonal residents participate in community life more fully. They patronize local businesses, use public resources and facilities, and involve themselves in local policy issues. Seasonal home owners pay local property taxes in amounts that can be significant, in that they often own a rural area's most valuable residential property.

Methodological Issues

There are two ways we can learn more about seasonal homes and their use; (1) through studies targeted specifically at seasonal homes, owners, or users; and (2) by clearly identifying seasonal home owners or users as subpopulations in general recreation and travel studies. The former are critical to obtaining a comprehensive profile of seasonal homes, their owners, and users. The latter help place seasonal home activity within the broader context of recreation and tourism.

Seasonal homes research is complicated by several factors. The basic design issues are discussed under two broad categories:

1) population and sampling issues, and
2) measurement problems.

Population and Sampling Issues

In any survey it is important to begin with a clear definition of the study population. There are four populations relevant to seasonal homes research; seasonal homes, seasonal home owners, seasonal home users, and trips to seasonal homes. Studies that measure characteristics of all four populations within a single instrument must keep careful track of units of analysis and apply appropriate weights and adjustments to account for differences between the sampling unit and the unit of analysis. For example, if one samples homes and asks about the last trip to the home, trips by frequent users will be underrepresented. Conversely, a traffic intercept study would overrepresent owners who make frequent trips. The potential biases and appropriate weighting procedures are similar to those discussed by Perdue (1986) for travel surveys. Most seasonal home surveys will sample from populations of homes or properties in seasonal home areas. Complete sampling frames rarely exist, as most property listings do not clearly distinguish seasonal from permanent residences. What was a seasonal home one year may be a permanent residence the next, or vice verse. Whether a cabin, trailer, camping vehicle, or boat is classified as a seasonal home will depend on the study purpose.

Home owners are rarely in one to one correspondence with seasonal home properties, so some care must be taken when sampling properties to study home owners. For many variables of interest, different responses will be given by male and female heads of a household. The variety of joint ownership arrangements associated with seasonal homes (e.g., partners in ownership, extended family ownership, time-sharing) can further confound surveys. Should all owners be surveyed, just the principle owner, or a randomly chosen owner? There is no one way to deal with these issues, but the researcher must be aware of them and plan a way to handle them.

Studying seasonal home users poses even more difficult problems. Users may include the owner, family, and friends, as well as renters. The owner may handle rentals or may turn the job over to a property management firm. Users will include both day and overnight visitors. The owner may not be able to speak for all users, and may not even be aware of some. Use will vary over the course of the week, weekend and year with recreational activities, season, and school vacation schedules. Sampling should be done carefully to insure adequate representation of different time periods.

Measurement Issues
The wider the variation in seasonal home characteristics, the more difficult it becomes to design structured questionnaires that apply well to all the possible situations. Personal or telephone interviews have the clear advantage over mailed instruments in allowing for flexible questions and response categories, but both approaches introduce sampling problems in that seasonal homes are occupied on an infrequent basis and may not have telephones. A seasonal home use scenario illustrates several measurement problems:

> *Chris and Pat Doe own a cabin in northern Michigan. Chris comes up to the cabin with two children and stays the whole month of June. Pat commutes every day for the first week, doesn't come the second week, and spends the last 2 weeks at the cabin on vacation. On one day of their stay, Chris and Pat drive 60 miles to a nearby National Park, sightsee in the area, then return to their cabin that night. During this time their eldest daughter and her family stay at the cabin for 4 nights, and two other couples visit on weekends. The Does leave the key for a neighbor who may use the cabin in the next two weeks.*

Complex patterns of use like these pose problems in how to measure "use". Should one measure nights or days the cabin is occupied, or trips to the cabin? How should one handle commuting and distinct parties arriving in separate vehicles? What is "party size" in this situation? Measuring recreation activity is even more difficult as different people may engage in different activities in each day of their stay.

The Doe's trip to the National Park illustrates problems with handling trips originating at the seasonal home in recreation and travel surveys. Would a survey of park visitors ask for the Doe's permanent address and assume the trip began there? Origins and destinations become less well defined when the seasonal home is used as a temporary "permanent" residence. Determining trip origins is especially troublesome for people who split their time between two permanent residences (e.g., in Michigan and Florida). Problems like these must be handled properly to insure the data's reliability and validity.

A Study of Seasonal Homes

A study of seasonal homes and home owners currently underway in northern Michigan illustrates some of the research questions that can arise in seasonal homes research, and our decisions on how to address them in this situation.

This study has three primary objectives: 1) to describe characteristics of seasonal homes (location, acreage, value, tenure, and setting), and seasonal home owners (household size and makeup, income, age, motivations for ownership, retirement status, recreation interests); 2) to measure patterns of seasonal home use, and recreation activity associated with seasonal homes; and 3) to estimate local area economic impacts associated with seasonal homes .

Design
The study objectives suggest somewhat distinct survey approaches. Based on the first objective alone, the study called for a general cross sectional survey of seasonal homes or seasonal home owners where we would send out surveys to a representative sample for a single point in time. As we began designing possible questions, it became clear that this approach posed problems for obtaining reliable information on use, recreation activity, and spending. While owners could probably estimate annual property tax, insurance, and major maintenance and repair costs for the past year, it was unlikely that they could recall detailed patterns of use and trip spending over an entire year. We could simplify the task by getting "last trip" information, but then the timing of the surveys becomes critical. No single time could capture complex seasonal use and activity patterns. Meeting objectives 2 and 3 required sampling throughout the year. Options included using a panel study in which the same home owners would be recontacted throughout the year, or drawing independent samples to be surveyed, in our case a subsample for each month of the year.

The use of a panel survey was ruled out. Not only would patterns of seasonal home use tend to aggravate the usual problems of panel attrition, but contact would need to be made by telephone, which many seasonal homes, especially the more modest ones, do not have. There were problems with surveying a new group of seasonal home owners each month as well. If general population characteristics were measured in different months, would the answers vary by season? Assessing economic impacts required measures of both annual and trip-related expenses in the local area. If independent samples were surveyed each month should we fix the year for annual expenses at calendar 1993 yielding distinct recall periods for different samples, or should we request annual spending within the past 12 months, so that each group was reporting spending for a different set of 12 months? We concluded that annual spending on property taxes, insurance, and so on were best gathered near tax time, suggesting a mailing to the full sample in the spring.

This left us with the problem of how to collect reliable data on seasonal home use, including recreation activity and spending while at the seasonal home. We were not sure that owners could make reliable estimates of these variables for an entire year's activities. Serious recall problems seemed likely, compounded by extremely variable use patterns across individuals and seasons of the year. Measuring use with any reasonable degree of accuracy and precision called for a different approach. We decided to adopt the "last trip" approach from travel surveys. We would ask for detailed information about party size, spending, and recreation activities only for the most recent trip. This would reduce recall error and simplify the questionnaire.

After weighing the two approaches (e.g., one survey sent in the spring versus surveys sent each month), we decided to compromise and do both in a two-phase survey. A general survey was sent to the full sample of 1300 seasonal homes in late May. The ***general*** survey covers descriptive information (objective 1) and annual expenses associated with the seasonal home. This will be followed by a 2-page ***trip*** survey that measures length of stay, recreation activity, party size, and trip spending for the most recent trip to the seasonal home. The trip survey also measures the number of nights the home has been occupied during the previous month. The first trip survey was mailed with the general survey to save on mailing costs. In subsequent months, we will sample only from subjects who have returned the general survey and agreed to fill out another 1 page (trip) survey. This allows us to eliminate properties that do not qualify as seasonal homes, and should significantly increase response rates for the phase 2 surveys.

Sampling
Our sample of seasonal homes was drawn from names of property owners on county property tax roles. Six counties were chosen to provide good representation of Great Lakes and inland areas on both the east and west sides of Michigan's northern lower peninsula. Three townships within each county were chosen, and names and addresses selected randomly from the property tax listings. Properties were considered "seasonal" if the permanent mailing address was non-local. Vacant properties were eliminated by excluding all properties valued at less than $10,000. Rental, commercial, and other non-seasonal home properties will be screened out by the first questionnaire. This sampling approach misses some low value seasonal homes, and any seasonal home owners whose tax bills are mailed to the seasonal home. Mailing to all property owners, however, would at least double the cost of the study. Going door-to-door was also considered, but judged to be too expensive and not effective enough, since few people are at seasonal homes in early spring.

Measurement
Some of the complexities of the design and reasons for particular questions can be illustrated for objective 2. For each county or area, we would like to estimate the number of people staying in seasonal homes by season or month. To estimate this number, we need to multiply the number of seasonal homes in the area by the average number of days per month it is occupied, by the average number of people in the home each day. Seasonal home counts are available from the Census. Monthly occupancies will be obtained in the trip survey. Respondents will be asked to circle the days of the month the home will be occupied on a calendar for that month. We will compute the average days occupied, test for variations by region and other characteristics, and estimate some simple models to explain variations and predict occupancy rates by month. Party size will be estimated for the most recent trip to the seasonal home. Information about guests and other visitors staying at the seasonal home during the recent stay will be included in estimating a daily party size. Recreation activity participation data for the recent stay will be gathered so that person days of boating, fishing, hunting and so on can be estimated in a form comparable to recreation use estimates for permanent residents. In a related study we will estimate recreation activity for visitors staying overnight in campgrounds and motels and for day users from outside the county in order to round out the complete picture of recreation use at the destination.

Conclusions
Seasonal homes are an important element of recreation and tourism. The existing research on seasonal homes needs to be updated and extended, working from exploratory to descriptive to explanatory studies.

A number of somewhat unique definitional, sampling, measurement, and overall research design problems arise in studying seasonal homes. These problems require attention to increasing the efficiency of seasonal home studies, while also capturing quite extensive variations within the population: variations in seasonal home types, in the characteristics and motivations of owners, in the recreational activity patterns of seasonal home users, and in the spatial and temporal use patterns of owners and others. As with recreation and tourism research more generally, seasonal home research will benefit from a variety of research approaches, including qualitative and quantitative, cross sectional and longitudinal, and use of both primary and secondary data sources. The temporal dimensions of seasonal home choice and use indicate a need to employ longitudinal designs, including time diaries, panel studies, and creative analyses of secondary data.

Other sources of information about seasonal home users include general recreation and travel studies. Recreation activity at and trips to seasonal homes are frequently measured in these studies, although the extent and accuracy of coverage is often unclear. If seasonal home owners are not explicitly included as a population subgroup in a recreation or travel study, much seasonal home related activity will be missed or measured inaccurately. It is better to exclude seasonal home use entirely than to be unsure about which or how much seasonal home activity has been included in a general recreation or travel study. In particular, general survey measures of the temporal patterns of both vacation trips and recreation activity could be substantially affected by the inclusion of a subgroup of seasonal home owners. If seasonal home use is to be covered by a recreation or travel study, the definition of the study population, sampling, and measurement instrument (i.e., the design and wording of questions) must be given careful attention. Questions should be evaluated to make sure they apply to the seasonal home subpopulation, and analyses should take into account the distinct patterns of this subgroup. As we gain a better understanding of the characteristics and behavior patterns of this population subgroup, our ability to accommodate them properly within other studies will improve.

Finally, recreation and travel surveys that do not intend to measure seasonal home related activity must be aware of possible contamination in their results if such activity is not explicitly excluded in their sampling frame or through filter questions. Recreation and travel researchers should assume that any activity potentially related to seasonal home use (e.g., local recreation during the tourism seasons, travel to and from popular recreation or tourism areas) may involve a population subgroup of seasonal home owners. Researchers need to make a conscious decision to include or exclude seasonal home owners. If the choice is to include the seasonal home subpopulation, we recommend treating it as a separate population stratum and carrying out some subgroup analyses. This approach will assure that the seasonal home component has been properly covered, while also contributing to our understanding of this important component of recreation and travel activity.

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Environmental Perceptions and Ethics



ENVIRONMENTAL ETHICS AND WILDERNESS MANAGEMENT: AN EMPIRICAL STUDY

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The underlying hypothesis of this study is that environmental ethics influence public attitudes toward wilderness management. To study this hypothesis, environmental ethics were defined, categorized, and measured empirically. Additionally, attitudes toward selected wilderness management issues were measured. Associations were found between beliefs in selected environmental ethics and attitudes toward selected wilderness management policies. These findings support the study hypothesis and suggest that environmental ethics can be studied empirically and provide insights into the future direction of wilderness management.

Introduction

Over the last 25 to 30 years, issues of how wilderness areas should be managed have occupied a prominent place in the minds of wilderness managers and recreationists alike. Such issues as crowding, reintroduction of natural predator-prey relationships, allowing naturally caused fires to run their course, and visitor limits have been at times, controversial. Issues such as these raise fundamental questions about what recreationists value in wilderness, what managers ought to do when managing wilderness areas, to what degree human influences should be allowed to impact on the natural function of wilderness ecosystems, and what responsibility humans have toward these natural ecosystems. In short, these issues raise questions of values and ethics.

This study is an attempt to test the hypothesis that there are relationships between environmental ethics and visitor attitudes about wilderness management. For the purposes of this study, environmental ethics will be defined as intellectual ideas about the appropriate relationship between humans and the natural environment.

An empirical approach to environmental ethics could provide information about the extent to which certain ethical ideas about the environment are prevalent in a segment of society. This in turn, could lead to a better understanding of how environmental ethics influence attitudes toward environmental policy including wilderness management. However, an empirical treatment of environmental ethics has been lacking.

Values and ethics can shape attitudes, while attitudes in turn shape policy. Heberlein (1989) points out that environmental managers find attitude studies useful because they provide information about public support and beliefs, as well as information for setting standards and about current and future behaviors. As he also points out, public attitudes have direct influence on policy decisions by showing support for some plans and rousing opposition to others. The study of environmental ethics can begin to help managers understand why the public holds certain attitudes.

Numerous authors have described the theoretical relationship between environmental ethics and attitudes toward environmental policy. Sayer (1991) indicated that contemporary society must examine its values and its attitudes toward the environment in order to create policy solutions to adequately address environmental problems. Stone (1973) used ethical arguments to reach the conclusion that natural objects should have standing in courts of law which would give nature a voice in policy decisions. One specific policy which has become law, The Endangered Species Act of 1973, can be interpreted as giving certain animals moral and legal standing (Nash, 1989). However, the relationship between environmental ethics and attitudes toward wilderness management policy has not been studied.

Objectives

To test the study hypothesis, three study objectives were developed. First, environmental ethics were defined and categorized. Second, a series of scale items was developed to measure the extent to which wilderness visitors subscribe to these alternative environmental ethics. Third, a series of scale items was developed to measure attitudes toward selected wilderness management issues. These scale items were combined to derive a measure of desired wilderness purity. For the purposes of this study, wilderness purity is defined as the absence of visible human influence within wilderness boundaries.

Methods

Literature Review

Through literature review, 16 different environmental ethics were identified. we will present only a brief description of these 16 ideas here. For a more thorough review of the literature, refer to Valliere (1994). The 16 environmental ethics were categorized into 5 broader categories. While these categories are an attempt to further classify the environmental ethics, we do not suggest that these are groups of environmental ethics actually found in society. These categories merely represent groups of environmental ethics which appear to have some theoretical commonality.

Anti-environment. The first category is the anti-environment category. The first environmental ethic in this category is the "threat to survival" ethic which suggests that nature should not be protected because it contains elements and processes which threaten human survival and civilization. The second environmental ethic in this category is the "spiritual evil" ethic which suggests that nature should not be protected because some interpretations of religious teachings tell us that nature is a spiritual evil.

Benign indifference. The second category is the benign indifference category. The first environmental ethic in this category is the "storehouse of raw materials" ethic which suggests that nature is neither good nor bad, it simply provides humans a source of raw materials to be used as human needs and wants dictate. The second environmental ethic in this category, "religious dualism", suggests that nature is neither good nor bad, but that it is fundamentally different from and secondary to humans.

Utilitarian conservation. The third category is utilitarian conservation. The first environmental ethic in this category is "anthropocentric humanitarianism" which suggests that certain elements of nature, particularly domestic and work animals, be treated carefully and that cruelty to such animals makes us somehow less human and may lead to cruelty to other humans. The second environmental ethic in this category, "efficiency," suggests that elements in nature of material worth should be used wisely to ensure their continued availability. The third environmental ethic in this category, "quality of life" suggests that certain elements of nature should be treated carefully because their existence contributes to the quality of our lives in either a material or aesthetic sense. The final environmental ethic in this category, "ecological survival," suggests that certain elements of nature be treated carefully because human survival may ultimately depend on the integrity of basic ecological functions.

Stewardship. The fourth category is stewardship. The first environmental ethic in this category is "religious duty" which suggests that nature be treated carefully because some religious teachings instruct humans that this is their religious responsibility. The second environmental ethic in this category, "future generations", suggests that nature be treated carefully because it is a basic human responsibility to pass along nature to future generations of humans. The third environmental ethic in the stewardship category is "reverence for life -- God's creatures" which suggests that nature be treated carefully because nature and living things were created by God and are thus deserving of our respect and even reverence. The final environmental ethic in this category is "reverence for life -- mysticism" which suggests that nature be treated carefully because all living things represent the spiritual mystery of life and are thus deserving of respect and even reverence.

Radical environmentalism. The fifth and final category is radical environmentalism. The first environmental ethic in this category is "humanitarianism" which suggests that sentient animals should be protected from human-caused pain and suffering. The second environmental ethic in this category is "animism/organicism/pantheism" which suggests that nature should be protected from human-caused harm because all things in nature are connected through a spiritual quality and thus are sacred. The third environmental ethic in this category is "liberalism/natural rights -- evolutionary" which suggests that nature be protected as a function of continued human extension of moral, ethical, and/or legal rights throughout society based on the fundamental relationship of all living things through the process of evolution. The final environmental ethic in this category is "liberalism/natural rights -- ecological processes" which suggests that nature be protected as a function of continued human extension of moral, ethical, and/or legal rights throughout society based on the fundamental relationship of all living things through ecological processes.

Survey Methods

In order to achieve study objectives 2 and 3, a survey questionnaire was constructed and a random sample of visitors to the Breadloaf Wilderness, Vermont was obtained during July, August, September and October of 1992. A total sample size of 250 was obtained. Visitors were initially contacted in the Breadloaf Wilderness by a members of our research staff and asked to participate in the study. If the visitors consented, their names and addresses were taken and the initial contact was completed.

A few days after the initial contact, participants were sent a copy of the survey questionnaire, which contained 62 statements to measure agreement or disagreement with the 16 environmental ethics and 15 statements to measure 12 areas of desired wilderness purity in the Breadloaf Wilderness. Participants also received a cover letter explaining the importance of each participant's response, and a postage-paid, self-addressed return envelope. One week after the initial mailing, a postcard reminder was sent to all study participants asking them to return the study questionnaire. Three weeks after the initial mailing, a second copy of the study questionnaire, a second cover letter imploring participants to return the questionnaire, and a second postage-paid, self-addressed return envelope were mailed to study participants who had not yet returned the questionnaire. This procedure prompted 196 study participants to return the questionnaire for a response rate of 78%.

Results

The results from the 62 environmental ethics statements were subjected to factor analysis to reduce the number of variables used in further analysis. This was accomplished through index creation guided by the factor analysis. Most of the environmental ethics remained the same. However, based on the factor analysis, some environmental ethics were combined while others were divided into two ideas. In the benign indifference category, "religious dualism" was divided into two concepts; "Intellectual Dualism" and "Humans have a right to use nature." In the stewardship category, "religious duty" and "reverence for life--God's creatures" were combined into a general "religious stewardship" ethic. In the radical environmentalism category, "liberalism/natural rights -- evolution" and "liberalism/natural rights --ecological processes" combined and into one ethic and also produced another concept "humans are a part of nature".

The mean index scores for each of the environmental ethics are shown in Figure 1. It is apparent from these results that all of the environmental ethics in both the anti-environment and benign indifference categories were rejected by respondents. The remaining environmental ethics were accepted at varying degrees by respondents.

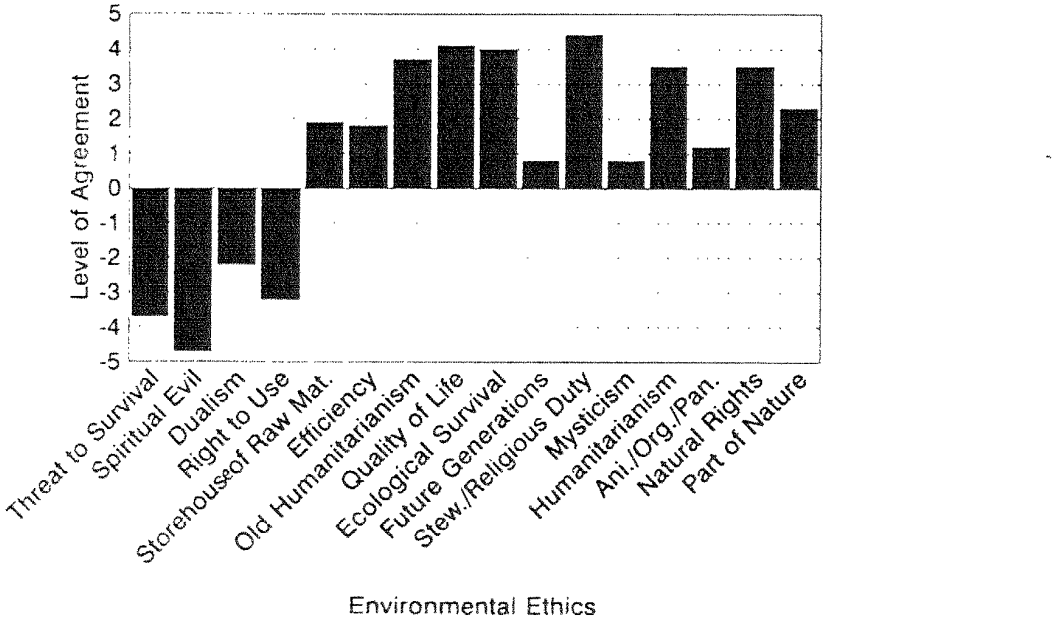


Figure 1. Mean index scores for environmental ethics.

Figure 2 shows the mean scores for each of the wilderness purity dimensions and the mean index score for overall wilderness purity. It is clear that while on some dimensions, visitors desired high degrees of wilderness purity, on average, they did not desire a pure wilderness experience. In fact, on three of the dimensions (trail signs, trail shelters, and responses to emergencies), a decidedly non-purist attitude prevailed. The average overall wilderness purity score indicates that visitors to the Breadloaf Wilderness desire an experience which has some of the qualities of primitive or pure wilderness recreation and some qualities of more developed types of recreation.

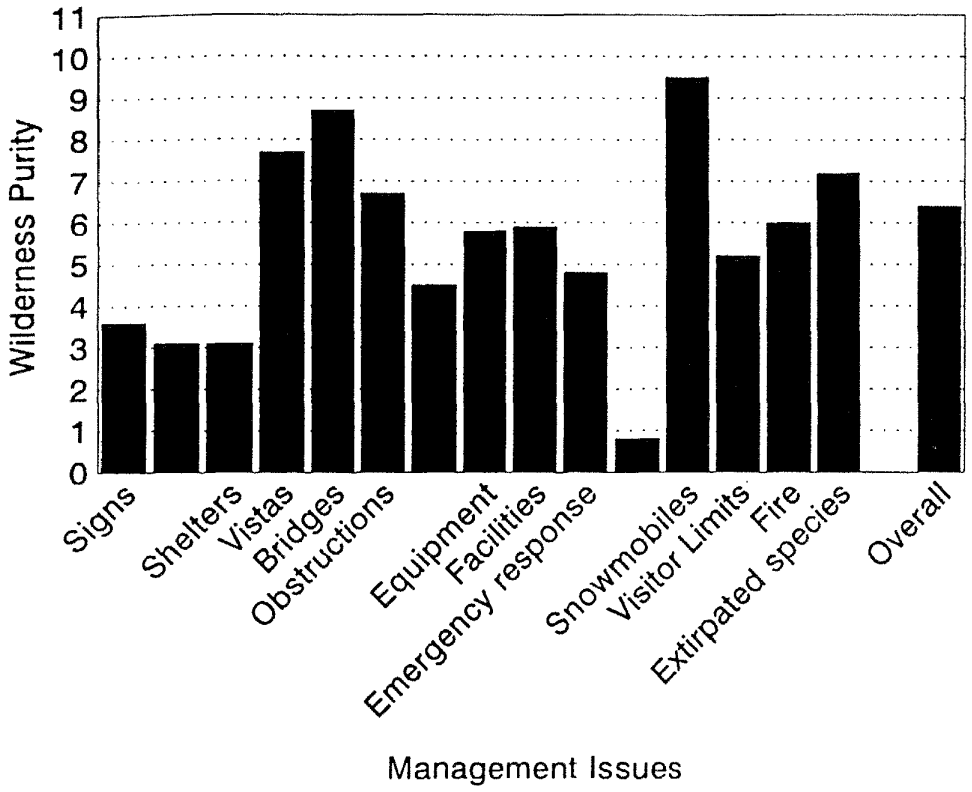


Figure 2. Mean wilderness purity scores.

To test the hypothesis that there are relationships between environmental ethics and attitudes toward wilderness management, multiple linear regression was used. The environmental ethics were used as independent variables while the index of wilderness purity was used as the dependent variable. Table 1 shows the results of this analysis. It is clear from these results that there are statistically significant relationships between some environmental ethics and visitor attitudes about wilderness management. Visitors who more strongly agreed with the "animism/organicism/pantheism" ethic, and who disagreed with the "religious stewardship," "stewardship for future generations" and "human right to use nature" ethics were more likely to desire a pure wilderness experience.

Table 1. Multiple regression results.

	Ani./Org./ Pan.	Rel. Stew	Fut. Gen.	Right to use
Regression Coefficient	0.42	-0.31	-0.19	-0.14

R Squared = .20

F Ratio = 9.73 Significance = .000
(4,157) Degrees of Freedom

Discussion and Implications

The results of this study have implications for wilderness managers. They indicate that wilderness visitors may not always be interested in a "pure" wilderness experience. There can be a number of reasons why this is the case. In the case of the Breadloaf Wilderness, many visitors are day hikers and may simply want to hike in an area that is convenient and natural, but not necessarily an area with only wilderness characteristics. The Breadloaf Wilderness meets these needs well. It is easily accessible from many Vermont towns and offers day hiking opportunities which range from very easy to extremely difficult, with panoramic views only short distances from trailheads.

The Breadloaf Wilderness is also bisected by Vermont's Long Trail which offers hikers developed campsites and shelters which are not consistent with a "purist" view of wilderness. However, Long Trail hikers may come to expect these facilities whether they occur in a wilderness area or not.

This study also associated visitor's environmental ethics with attitudes toward wilderness management. This is important from a scientific standpoint because it demonstrates that environmental ethics can be studied empirically, thus allowing such relationships to be demonstrated in other areas as well. However, the study of environmental ethics can also benefit natural resource managers. By understanding environmental ethics, managers can begin to understand not only what attitudes the public holds, but also why

they hold those attitudes. In the case of this study, it was apparent that persons who subscribe to environmental ethics which have a biocentric focus (animism/organicism/pantheism) tended to prefer a "pure" wilderness experience. This may be because they see wilderness not only as a place for human recreation, but also as a place for this ethical idea to be expressed. Likewise, those visitors who subscribe to ethics with an anthropocentric focus (humans have a right to use nature) might prefer a less "pure" wilderness because visible human influence in nature is ethically correct for these visitor.

Based on the results of this study, there are several implications for wilderness managers. Wilderness managers should take environmental ethics into account when managing wilderness areas. By taking environmental ethics into account, wilderness managers can better serve the public by understanding why certain attitudes are held. Additionally, by understanding environmental ethics, potential conflicts can be averted by better understanding the public. This study also indicates that visitor education may be necessary when wilderness purity is an issue. If a management intervention may change the perceived level of wilderness purity in either direction, some users may find the change unsettling. Education may tend to diffuse some negative feeling toward the action.

The results of this study also indicate that further research is necessary. A survey of wilderness managers may be helpful in identifying differences in environmental ethics and attitudes between managers and the public. Additionally, longitudinal study of environmental ethics could help to determine whether they are relatively stable concepts or whether they change over time and across various economic and social conditions.

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CONCERN WITH THE RURAL ENVIRONMENT: URBAN VIEWS ON THE USE OF AGRICULTURAL PESTICIDES AND CHEMICALS[1]

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This paper explores the dimensions of agricultural chemical and pesticide concern, and its correlates. Concern was found to be broad, and not limited to food safety, environmentalism, or altruism. Social bases were found to be the best predictors of concern, followed by rural beliefs and attitudes, and rural visitation behavior.

Introduction

The use of agricultural pesticides and chemicals has been credited, in part, with the increasing productivity of the American farmer. These specific agricultural inputs have enabled grocery stores to stock large quantities of affordable and unblemished food stuffs (Sachs et al. 1987; Bunn et al. 1990). Nonetheless, the application of such products is associated with negative externalities including disruptions to the food chain, poisoning of wildlife, fish and birds, and groundwater, stream, and air pollution (Carson 1962; Rodgers et al. 1987). An expanding epidemiological literature suggests that acute and long-term effects can induce neural disorders, leukemias, organ failure, and various cancers (Headley 1967; Kitagawa and Hauser 1973; Rosenblatt and Moscovice 1982; Spindler 1983).

Pennsylvania's population of nearly 12 million people, includes a small minority, less than 2 percent, of farmers. Despite their small numbers, over 30 percent of the state's land base is in agricultural land use, and about 60 percent is forested. Many believe that farming is synonymous with rural areas (Swanson 1991). However, in Pennsylvania, the most rural counties are likely to be heavily forested, with much smaller percentages of farm land. In Pennsylvania, most urban centers are in close proximity to production land. The concern over agricultural chemicals and pesticides can be seen as a rural-urban interface issue, and the perceptions of these urban residents becomes a very important factor of influence within the state.

Farmers are a small minority, and great concern over their farming practices could impact their operations. In fact, regulations requiring certification of workers who handle these inputs are placing more demands on their time. Further, current restrictions that have been placed on certain agricultural chemicals and pesticides are impacting the mode of agricultural production (Vandeman et al. 1992).

Some exploration of the concern held by Pennsylvania's residents regarding pesticides and agricultural chemicals has occurred (Bealer and Willits 1968; Sachs et al. 1987; Weaver et al. 1991). These studies have suggested that concern over this issue is multidimensional. They have identified three areas of citizen concern: 1) food safety, 2) environmentalism, and 3) altruism.

Food Safety

Concern over agricultural pesticides has been primarily examined as a consumer food safety issue. This is especially true of pesticide residues. Surveys have shown that consumers are increasingly concerned about the occurrence of pesticides residues in food (Burbee and Kramer 1986; Sachs et al. 1987; Food Marketing Institute 1989; Bunn et al. 1990). Despite the high levels of reported concern regarding pesticide residues, most respondents still have confidence in the overall safety of the food supply (Food Marketing Institute 1989). However, recently Jussaume and Judson (1992) suggested that consumer confidence in food safety has eroded.

Environmentalism

Environmental awareness concerning the impact of pesticides and agricultural chemicals was heightened by Rachel Carson's *Silent Spring*. Soon after the publication of this work, Bealer and Willits (1968) conducted a survey to determine the level of concern with pesticides and agricultural chemicals in Pennsylvania. Two decades later a similar survey was conducted by Sachs et al. (1987) who determined that respondents' general concern with pesticides had increased greatly. They also found that the highest levels of concern being reported for the environment. Sachs et al. (1987) contribute much of this increase to an awareness among citizens that the environment is "an enduring social concern" (page 98).

Altruism

Sachs et al. (1987) determined that the highest levels of reported concern over the impact of pesticides was for the environment. However, the greatest percentage increase of concern over a two decade period was for farmers who handle pesticides. They suggest that this is partially due to increased consumer familiarity with pesticides and their application. Sachs et al. (1987) point out that many modern pesticides and herbicides have acute toxicity, but breakdown quickly leaving few residues. This places farmers, farm workers, and wildlife in the immediate area at greatest risk.

Weaver et al. (1991) suggest that concerns about pesticides could be grouped in two areas: 1) personal health risks and 2) impacts that go beyond the individual consumer. Personal health risks generally relate to food safety. The second set of concerns relate to all external impacts of pesticides. Weaver et al. (1991:13) list these concerns as "dangers to farm workers, wildlife, groundwater, and the environment." Though these items overlap with environmental concern, it is the thesis of Weaver et al. that they represent a more generalized concern to all aspects *external to the individual*, including the environment.

Research Objectives

Drawing upon measures of agricultural chemical and pesticide concern from past research (Bealer and Willits 1968; Sachs et al. 1987; Weaver et al. 1991), this analysis assesses the level and domains of this concern. Particular attention is given to the areas of food safety, environmentalism, and altruism. Determining the level and dimensions of pesticide concern for urban respondents would enable further analysis into why respondents hold such attitudes. Given the proximity of agricultural production to these respondents, their concerns are important, and may give insight into potential conflicts in the future.

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This paper has three interrelated objectives:

1. to explore the level and dimensions of pesticide concern held by urban residents;
2. to develop measures of such concerns and to identify social bases, attitudes, and behaviors that are related to pesticide concern; and
3. to develop a multivariate block model that establishes the strength of social bases, attitudes, and behaviors, while controlling for all variables.

Approach

A mail survey following the Dillman (1978) method was conducted seeking information on the level of concern for agricultural pesticide and chemical use of urban residents. A total of 3,611 residents of the nine cities in Pennsylvania with a population of 50,000 or more in 1990 were contacted. Completed questionnaires were returned by 1,524 respondents, representing a 42 percent response rate (Willits, et al. 1992).

Exploring the Dimensions of Pesticide Concern

The urban residents were asked a battery of six items concerning agricultural pesticide and chemical use (Table 1). The frequency of responses show great concern about the usage of these products. Many respondents strongly disagreed, or disagreed that food safety was *not* threatened by these inputs. However, of all these items, respondents were more likely to be undecided on these two issues. Majorities strongly agreed or agreed that agricultural sprays pollute the environment and that such pesticides threatened the safety of wild birds and animals. A majority of the urban respondents rejected the notion that chemical fertilizers pose *no* serious threat to the environment. The last item, farmers who handled pesticides are endangered, elicited a similarly high amount of concern. These six items were factor analyzed to see if the respondents conceptualized these differing threats from pesticides and chemicals as separate concerns (i.e. food safety, environmental, or altruism concern). It was hypothesized, on the basis of previous research, that items 1 and 2 would form a food safety factor, items 3, 4, and 5 would load together on a factor that would represent environmentalism, and that items 3, 4, 5, and 6 would also load together to represent an altruism domain.

Table 1. Responses of urban residents to questions about agricultural pesticide and chemical concerns.

Statements	Response				
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
	- - - - - - - - - Percent - - - - - - - - -				
It is safe for people to eat fruits and vegetables that have been sprayed or dusted with pesticides on the farm.*	2.7	26.3	31.4	28.6	10.9
Agricultural pesticides do not contaminate meat and poultry.*	1.2	11.3	38.4	36.7	12.5
Agricultural sprays used to control insects and weeds pollute the environment.	21.0	43.8	21.9	11.4	1.9
Chemical fertilizers in agriculture pose no serious environmental problem.*	2.0	11.2	22.5	44.8	19.5
The use of agricultural pesticides threatens the safety of wild birds and animals.	17.7	49.6	23.1	7.9	0.9
Farmers who handle pesticides place themselves in danger.	12.0	53.1	24.7	8.8	0.7

* These items were reverse coded for the analysis.

Surprisingly, despite support for multidimensional concerns, when the analysis was conducted only one factor was extracted. This single factor solution suggests that concern with pesticides is not limited to food safety, environmental, or altruism issues, but rather is conceptualized as a broader concern. This factor accounted for 51.7 percent of the variation within the model. The Eigenvalue was 3.2, all items had factor loadings of .650 or higher, and using Armor's (1974) theta reliability for factor scales, a coefficient of .86 was generated, indicating a high level of internal consistency [2,3].

Correlates of Pesticide Concern

The three major groupings of *social bases*, *behaviors*, and beliefs *and attitudes* are expected to influence the level of general concern urban residents hold towards pesticides and agricultural chemicals. These specific variables, their hypothesis, and their operationalization follow.

Social Bases

More than a decade ago, Van Liere and Dunlap (1980) examined the social bases for environmental concern. They studied the major hypothesis regarding environmental concern and the variables age, income, education, sex, residence, party affiliation, and ideology. Van Liere and Dunlap's review was limited by several factors. First, they only reported bivariate correlations, and second, they focused only on the most commonly used variables. Despite these shortcomings, this article has been viewed as the best attempt to explain the relationship of these core variables to environmental concern (Scott and Willits 1992).

2/ Responses to the questions concerning agricultural pesticide and chemical uses were scored 1 to 5 with 1 = strongly disagree and 5 = strongly agree and scaled (with a range of 1 to 5). The items that rejected the possibility of safety threats were reverse-coded, so that for all items, a higher score reflected greater concern with the use of these items in agricultural production. The mean of the responses for the six items was derived for each respondent.

3/ The theta coefficient is interpreted similarly to Chronbach's alpha, and is used for factor scales because it does not assume that all items are weighted equally.

Following the work of Van Liere and Dunlap (1980), females and the young are expected to exhibit greater concern about the use of pesticides and chemicals. For income and education a positive relationship with concern is expected. Respondents raised in rural areas, were expected to be less concerned about the use of agricultural pesticides and chemicals. Those who identified themselves as Democrats and those who thought of themselves as liberals are expected to be more concerned.

Information about the respondents' personal attributes of age, educational level, income, and gender were obtained for each respondent. Age was coded into 3 categories: 1) 18-34; 2) 35-64; and 3) 65 years and over. Educational attainment was divided into four categories and coded 1 to 4 as follows: 1) less than high school graduation; 2) high school graduate, no further formal education; 3) some college; or 4) college graduate. Income level was measured in three categories coded 1 to 3: 1) less than $15,000 per year; 2) $15,000-44,999; and 3) 45,000 per year or over. Gender was coded so that females were 0 and males were 1. Party affiliation was coded so Republicans were 0 and Democrats were 1. Ideology was scored so conservatives were 1, moderates were 2, and liberals were 3. A question asking the respondents where they grew up as children was asked. These responses were coded so that those who responded in the countryside outside of a city or town were assigned a score of 1. Those raised in suburbs, towns, or cities were scored as 0.

Rural Visitation Behavior

Experience with rural areas gained through visitation was expected to relate to concern about agricultural chemicals and pesticides. Those who visit rural areas frequently to interact with the environment were expected to display more concern. This reflects the increased awareness of the environment that such respondents were thought to have developed. For those respondents who visit rural areas frequently for social reasons, less concern is expected, as these respondents may be more concerned about the importance of agricultural production to the rural economy.

Behavioral information was obtained on the respondents frequency of visits to rural areas for recreation, vacation, outdoor activities, to enjoy the natural environment, and to visit people. The possible responses were assigned the following values for each question: 1) never, 2) seldom, 3) often, and 4) frequently. The scores were summed for each case to form a scale called Environmental Visits. The grand mean for this scale was 2.8. A similar series of questions were asked regarding frequency of visits to rural areas for Social Contacts. Respondents were asked if they went to rural areas to visit: friends, relatives, rural people, or to participate in rural lifestyles. The grand mean for this scale was 2.3. Alpha reliability for the two indices were .82 and .79 respectively.

Rural Beliefs and Attitudes

Perception and attitudes were also expected to relate to concern over agricultural pesticide and chemical use. A Positive Images scale was used to represent the "rural mystique" (Willits, 1993). The rural mystique, as measured through the Positive Images scale assess support for stereotypical rural attributes, including, friendly people, low crime, low stress, and satisfying lifestyle. The blanket association of rural things being good may reduce the concern one holds over chemical and pesticide issues.

One's position on rural development options could influence the level of concern about pesticides. Those favoring agriculture as a development tool, may be pro-agriculture, and are expected to be less concerned about agricultural pesticides and chemicals. Though all respondents are urban residents, those who wish to live in rural areas may be more concerned because of the future possibility of living in a polluted environment.

Responses to the Positive Images items were scored 1 to 5 with 1 = strongly disagree and 5 = strongly agree, with a mean of 3.6. The alpha reliability coefficient of this scale was .58. A specific question asked how respondents felt about the role of agricultural production in rural economic development policy. Those responding low priority were coded as 1, those assigning a middle priority were coded as 2, and the highest priority was coded as 3. One item asked where the respondent would most like to live. Responses were coded so that those who responded in the countryside outside of a city or town were assigned a score of 1. Those favoring suburbs, towns or cities were given a score of 0.

Table 2. Multivariate relationships for the agricultural chemical and pesticide concern index and the independent variables.

	Model I	Model II	Model III	Complete Model
Variable	B	B	B	
Social Bases				
Age	-.019		-.016	-.013
Income	-.067***		-.058***	-.065**
Sex	.220***		.205***	.225***
Education	.050*		.050*	.033
Party	.089***		.094**	.082**
Ideology	.104***		.101***	.102***
Childhood residence	-.225***		-.157**	-.186**
Rural Beliefs/ Attitudes				
Positive images	.002	-.006		.000
Negative images	.030	.021		.020
Development options	-.058*	-.048		-.048
Desired residence	.099	.061		.089*
Visitation Behavior				
Environment visits		.124***	.148***	.121***
Social visits		-.172***	-.166***	-.136***
Constant	3.293***	3.486***	3.588***	3.310***
Adjusted R square	.13	.06	.11	.15

* significant at the .05 level
** significant at the .01 level
*** significant at the .001 level

The Bivariate Models

The expected relationships with age, sex, party affiliation, and ideology were found (data not shown). Though Van Liere and Dunlap (1980) found strong differences by educational level, this relationship was not statistically significant in the bivariate model. Further, a weak negative relationship with income was found when a positive relationship was expected.

Younger respondents, females, and those with low or medium incomes, were more concerned about the impact of these products. Democrats, and those with liberal ideologies were also more concerned. If, as a child, the respondent lived in a rural area, they exhibited less concern.

Among the attitudinal items, the Positive Images scale and the Desired Residence variable did not produce significant differences. However, those who thought agriculture was a *poor* economic development strategy were more concerned about pesticide and chemical use.

For the Social Visitation scale, those who frequently visit were more concerned -- the opposite of the anticipated relationship. The Environmental Visitation scale did not produce any significant differences.

The Multivariate Model

Multiple linear regression was used to model the three correlates of pesticide concerns (social bases, attitudes and beliefs, and visitation behaviors). The social bases were found to be the strongest indicators of concern, as shown by the 9 percent decrease in explained variation (R^2), when these variables were excluded from the complete model (Table 2). The belief and attitude block and visitation behaviors block were roughly equal in explanative power. Income, sex, party affiliation, ideology, and childhood residence were the significant social bases variables. As income increases, concern decreased. Females, Democrats, liberals, and those raised in non-rural settings all displayed more concern. Those who visit rural areas for social reasons were more concerned. The traditional development options variable was significant in two of the partial models, but was insignificant when all variables were controlled for. Those wishing to move to rural areas, and those that visit rural areas to be in the environment displayed more concern. No relationship in the multivariate model changed from the bivariate model. However, frequency of environmental visits did become significant, influencing the level of concern.

Discussion

The availability of data from an urban sample of Pennsylvania residents, provided information on how concerned these respondents were about agricultural pesticide and chemical use. Their reported levels of concern were great. Moreover, this issue is not limited to consumer-food safety, but rather is viewed by the public as a more comprehensive threat. For the most part, this analysis affirms the social bases hypothesis discussed by Van Liere and Dunlap (1980), particularly at the bivariate level. The only major exception is that of education, which was only mildly related in two of the block models. In spite of the fact that many of these variables were statistically significant, their combined power is not overwhelming. In an attempt to extend the social/demographic analysis of the type done by Van Liere and Dunlap, attitudes, beliefs, and behaviors were included in the analysis. However, these variables did not add substantively to the model's explanation.

Implications Stemming from Agricultural Chemical and Pesticide Concern

These findings suggest that agricultural production in close proximity to suburban and urban areas will probably face new challenges in the years ahead. Concern for the environment, food safety, and farm workers may lead to significant restrictions on pesticide and chemical use. Although these challenges to farmers may seem daunting, they may initiate agricultural innovations that are more profitable, as well as reduce the environmental impacts of these inputs. As the cost of agricultural chemicals and pesticides, training, and certification increases, the economic incentive to adopt alternative strategies will increase. Some of these innovations are well underway, and include: low input sustainable agriculture, use of beneficial insects, pest resistant hybrids, insecticidal soaps, and bacterial based insecticides (Musser 1990; Vandeman et al. 1992). In fact, many of these "alternative" methods are rapidly becoming accepted as conventional techniques. The level of concern shown in this study suggests that pursuing alternatives to chemicals and pesticides would be a prudent course of action, especially for those who farm on the rural-urban interface.

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THE 1992 VERMONT RECREATION SURVEY AND ENVIRONMENTAL INDEX: VERMONTERS' PERCEPTIONS OF RECREATIONAL AND ENVIRONMENTAL ISSUES IN VERMONT

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In 1992, Vermonters rated the state's recreational resources a "B-" with a corresponding grade of "B" for the quality of the state's environment. Scenic resources continued to be rated most highly as were state trails and commercial recreation establishments. Concern for water resource quality, solid and toxic waste disposal, acid rain, agricultural land loss, and increasing development, was discovered. Recreation greenways and the accommodation of bicyclists in road development was supported as was the development of lighted trails for night skiing. Perceived positive effects of tourism were matched by concerns about impacts on traffic conditions, costs of land and housing, and crime in Vermont.

Introduction

In developing the 1993 Vermont Recreation Plan, the Vermont Department of Forests, Parks and Recreation contracted the Center for Rural Studies and the School of Natural Resources at the University of Vermont to poll state residents' perceptions of recreational issues and environmental quality. The recreation plan identifies and addresses statewide recreation needs and issues and prioritizes them into legislative protections and resource allocations. The recreation plan assures that facilities and resource opportunities, planned and developed by local, state, and federal providers, correspond with the needs of citizens and maximize opportunities for the dollars spent. A final component of the study was the continuation of the Vermont Environmental Quality Index, a study begun by Dr. Robert Manning of the University of Vermont's School of Natural Resources. Since 1986, the Environmental Quality Index has focused on Vermonters' perceptions of the status of Vermont's rich and diverse natural resource base and their opinions regarding contemporary resource issues.

Methodology

From November 30, 1992, through December 5, 1992, attitudes and perceptions regarding recreation and environmental policy were gathered through a telephone survey of 510 Vermont adults. The survey response rate was 57.6%, with a refusal rate of 33.4% and a termination rate of 8.9%. Two factors were identified as possible influences on these rates: 1) the survey was conducted immediately following a major national election that had spawned numerous telephone polling activities throughout Vermont, and 2) the survey length averaged approximately 25 minutes and may have deterred some potential respondents from starting or completing the survey. The statistical confidence level of the survey results was 95% with a precision of ± 4%.

Survey responses were entered in D-BASE III+ and analyzed using the Statistical Package for the Social Sciences (SPSS-X). Simple frequencies were produced for all survey questions. T-Test analyses of mean responses and Kolmogorov-Smirnov analyses of median responses were conducted to compare survey results with the results of previous surveys conducted in 1988 and 1990 in which Vermonters were asked similar questions about recreation and the environment.

Recreational Resources

Survey respondents evaluated the quality of Vermont's recreation resources using letter grades of A, B, C, D, or F. Letter grades were converted to numerical equivalents (A=4, B=3, C=2, D=1, and F=0) in order to derive a "grade point average" (GPA). Recreation resource GPAs ranged from 2.369, a C+, for the quality of recreational services and facilities provided by local governments, both cities and towns, to 3.632, a B+, for the scenic quality of Vermont's landscape.

In addition to scenery, trails and commercial recreation establishments were ranked relatively highly in comparison to other resources. The quality of water resources for recreation--rivers, streams, lakes and ponds--along with the quality of local public recreation facilities, received relatively low grades compared to other recreation resources (Table 1).

T-Test analysis of mean survey responses for 1988 and 1992 revealed statistically significant changes in Vermonters' perceptions of the quality of recreation resources. Survey results reported significant improvement in the perceived quality of Vermont's scenery which continued to be rated rather highly in comparison to other resources in both 1988 and 1992. While the quality of local public recreation facilities remained at the bottom of the quality scale at both points in time, Vermonters reported a significant improvement in perceived quality in 1992. Significant declines in perceived quality were reported for two recreation resources: state and federal forests and parks, and Vermont's rivers and streams. While commercial recreation establishments received a lower grade of "B-" in 1992, this decline was not found to be statistically significant (Table 1).

Respondents were asked to evaluate a variety of recreational and environmental issues and potential problems, in terms of whether they were considered to be "big," "small," or "no" problems. At least half of the respondents considered each of the issues mentioned to be either big or small problems with the exception of two issues: the extent of government liability for injuries to recreationists and overcrowding of recreation trails and paths.

Looking specifically at "big" problem responses, more than half of the respondents indicated that nuisance aquatic plants were a "big" problem (56.9%), followed by the destruction of fish habitat (51.8%) and vandalism of public recreational areas (51.6%). When "big" and "small" problem responses were summed, vandalism of public recreational areas (91.0%) appeared at the top of the problem list, followed by lack of respect for private property by recreational users (87.8%), shoreland development (87.2%), and loss of Vermont's scenic landscape (82.6%). Destruction of habitat for wildlife (82.3%) and fish (81.6%) were also perceived to be problems, either big or small. At the other end of the spectrum, a substantial minority of respondents reported that the issue of crowded trails and paths was not a problem (40.9%), as well as the potential problems of posting of private land (35.3%) and lack of community outdoor recreational facilities (32.2%).

Table 1: Comparison of quality of recreation resources (1988 & 1992).

Recreation Resource	1988		1992		1988-1992
	Avg.[a]	Grade[b]	Avg.[a]	Grade[b]	Trend[c]
Scenery	3.575	B+	3.632	B+	Improvement
Trails	3.149	B	3.142	B	No Change
Commercial Recreation Establishments	3.025	B	2.981	B-	No Change
State/Federal Forests and Parks	3.090	B	2.914	B-	Decline
Lakes and Ponds	2.906	B-	2.804	B-	No Change
Rivers and Streams	2.802	B-	2.724	B-	Decline
Local Public Recreation	2.362	C+	2.369	C+	Improvement

a/ Average refers to the mean score derived from the following coding system: A=4; B=3; C=2; D=1; F=0.
b/ Grades were assigned as follows: A (Excellent) = 4.0, A- = 3.67, B+ (Good) = 3.33, B = 3.00, B- = 2.67, C+ (Fair) = 2.33, C = 2.00, C- = 1.67, D+ (Poor) = 1.33, D = 1.00, D- = 0.67, and F (Failure) = 0.00.
c/ Trends include: Decline = statistically significant decrease ($p \leq .05$); Improvement = statistically significant increase ($p \leq .05$); and No Change = no statistically significant change ($p > .05$).

Issues surrounding liability for injuries to recreationists received the greatest number of "Don't Know" responses indicating that Vermonters responding to the survey were unaware or uncertain of how these issues affected government (31.8%), commercial establishments (29.2%), and private landowners (24.4%). Respondents also expressed uncertainty regarding the issue of regulation of boat moorings on lakes with 27.8% responding with "Don't Know."

Comparison of 1992 survey responses with data collected in 1988 revealed a number of shifts in Vermonter's perceptions of the importance of recreation-related issues (See Table 3). It should be noted here that these "shifts" are the result of changes in mean survey responses of 0.1 or greater--relatively small variations that are not necessarily indicative of dramatic changes in public opinion; however, analyses of median survey responses revealed some statistically significant changes in respondent perception.

In both the 1988 and 1992 surveys, Vermonters reported the vast majority of the issues in question to be problems, either big or small. From 1988 to 1992, statistically significant declines in levels of concern were discovered in a number of areas including: destruction of wildlife habitat; shoreland development; loss of Vermont's scenic landscape; inadequate design of commercial recreation areas; liability of commercial recreation areas for injuries to recreationists; overcrowding of trails; and posting of private land against public access. Other areas where there were declines in concern from 1988 to 1992, albeit not found to be statistically significant, included: fish habitat destruction; high cost of commercial recreation areas; and overcrowding of lakes and ponds.

Statistically significant increases in levels of public concern from 1988 to 1992 were discovered regarding the high cost for use of public or government-managed recreation areas and the lack of agency responsiveness to the recreation needs of Vermonters. Other areas of increased concern that were not found to statistically significant included: lack of public information on recreation issues and opportunities; lack of indoor recreation facilities; lack of recreation trails and greenways; conflicts among users of rivers and streams; and lack of organization of recreation user groups.

Future Recreation Directions

Respondents were surveyed regarding their level of agreement, or disagreement, with a number of recreation-related issue statements. Respondents indicated high levels of agreement with the concept of community greenways for pedestrians and bicyclists (91.6%) and for the inclusion of adequate shoulder for bicyclists in the development or improvement of roads and highways (87.6%).

Regarding ski industry issues, respondents agreed with the development of night skiing facilities (72.1%). Less than half of the respondents (47.6%) agreed that expansion of ski areas in Vermont was a good idea, and even fewer (38.1%) supported water withdrawals from rivers and streams for snow-making activities.

In terms of recreation resource development, nearly two-thirds of the respondents (63.5%) agreed with government acquisition of more land in Vermont for recreation. Just more than half of the respondents (55.4%) supported using a portion of gas taxes to help fund recreation trails and paths. Less than half of the respondents (48.4%) supported using boater registration fees to increase boating access to Vermont's waters; however, one should note that a substantial number of respondents (12.0%) indicated they did not know, or were uncertain, whether they supported this concept.

Approximately half of the respondents agreed that government and private business in Vermont cooperated well in providing recreation opportunities, while a substantial minority (35.7%) disagreed with this statement. Finally, a majority of respondents (75.9%) voiced clear support with the statement that state government should do more to promote tourism in Vermont.

Comparison of 1992 and 1988 survey responses revealed statistically significant changes in Vermonters' attitudes toward selected recreation issues. Support increased significantly for more state promotion of tourism. The expansion of ski areas in Vermont, while supported by less than half of the survey respondents, was viewed significantly more favorably in 1992 than in 1988. Support declined significantly for the designation of all-terrain vehicle areas, the development of additional swimming areas, and more government acquisition of land. Support declined regarding the development of more marinas; however this change was not statistically significant.

Recreation Expenditures

Survey respondents were asked to prioritize various spending initiatives for developing recreational opportunities in Vermont. While there was clear support demonstrated for each initiative, the maintenance of existing recreation lands and facilities was at the top of the list with 40.6% of the respondents considering this to be "very important" and 53.3% considering it "important" (Table 2).

Comparison of survey responses from 1988 and 1992 indicated that Vermonters continued viewing all four types of recreation expenditures as being important. Overall, fewer Vermonters in 1992 identified expenditures as being "Very Important"--perhaps a reflection of the economic declines experienced by Vermont as well as the rest of the nation. The maintenance of existing resources--lands and facilities--was considered to be of high importance at both points in time relative to other spending priorities (Table 2).

Table 2. Attitude toward recreation expenditures (1988, 1992).

Recreation Expenditures	Level of Importance							
	Very Important		Important		Unimportant		Very Unimportant	
	1988	1992	1988	1992	1988	1992	1988	1992
	(Percent)							
Developing Additional Facilities	12.6	13.0	62.6	62.0	23.8	21.7	1.0	1.2
Developing Additional Programs	15.7	12.8	57.1	56.9	25.1	27.3	2.1	1.0
Maintaining Existing Lands and Facilities	46.0	40.6	52.0	53.3	2.1	4.9	0.0	0.0
Acquiring Additional Lands	18.0	12.2	54.7	55.5	25.8	27.4	1.5	3.0

The 1992 Environmental Quality Index

In two-year intervals since 1986, Vermonters have been polled regarding their opinions of the quality of Vermont's environment. In 1992, the highest grades were given to Vermont's scenery (3.756), woodlands and forests (3.304), and wildlife (3.209). The quality of Vermont's water resources--rivers and streams (2.674), drinking water (2.666), ground water (2.640), and lakes and ponds (2.437) received relatively low ratings compared to other components of the environment (Table 3).

Comparison of Vermonter's perceptions of environmental quality since 1986 illustrates several trends. At each point in time, the quality of Vermont's scenery received the highest marks in comparison to other components of the environment. While the grade for scenery remained an A- from 1990 to 1992, statistical analysis revealed that the increase in grade point average was actually a significant improvement. Other components of the environment where there were statistically significant improvements in perceived quality from 1990 to 1992 included Vermont's woodlands and forests, wildlife, deer herd, and river and stream resources. Public perception of the quality of Vermont's state parks continued to decline with the change from 1990 to 1992 being significantly different. There were no significant changes in perception of the quality of air, fisheries, drinking water, ground water, lakes and ponds, and in Vermont's overall natural environment between 1990 and 1992 (see Table 3).

Table 3. Trends in perceived environmental quality (1986-1992).

Environment	Year				Trend[a]	Grade[b]
	1986	1988	1990	1992	1990-1992	1990-1992
	(Average)					
Scenery	3.80	3.72	3.73	3.76	Improvement	A- to A-
Woodlands/Forests	3.26	3.22	3.21	3.30	Improvement	B to B+
Wildlife	3.05	2.97	2.84	3.21	Improvement	B to B+
Air Quality	3.20	3.17	2.96	3.20	No Change	A- to A-
Overall Quality of VT Environment	3.12	3.09	2.91	3.16	No Change	B- to B
State Parks	3.45	3.24	3.34	3.12	Decline	B+ to B
Deer Herd	2.55	2.42	2.57	3.08	Improvement	C+ to B+
Fisheries	2.82	2.84	2.66	2.82	No Change	C+ to B+
Rivers & Streams	2.69	2.58	2.48	2.67	Improvement	C+ to B-
Drinking Water	2.75	2.85	2.68	2.67	No Change	B to B
Ground Water	2.70	2.76	2.50	2.64	No Change	B- to B
Lakes & Ponds	2.61	2.46	2.23	2.44	No Change	C to C+

a/ Trends include: Decline = statistically significant decrease ($p \leq .05$); Improvement = statistically significant increase ($p \leq .05$); and No Change = no statistically significant change ($p > .05$).

b/ Grades were assigned as follows: A (Excellent) = 4.0, A- = 3.67, B+ (Good) = 3.33, B = 3.00, B- = 2.67, C+ (Fair) = 2.33, C = 2.00, C- = 1.67, D+ (Poor) = 1.33, D = 1.00, D- = 0.67, and F (Failure) = 0.00.

Tourism in Vermont

Tourism is generally recognized as one of the largest industries in Vermont and its impacts on the economy, development and the state's resources are important considerations for planning. Overall, survey respondents indicated that visitors and tourists had positive effects on a variety of aspects of life in Vermont. Opportunities for jobs (68.9%), cultural activities (66.7), shopping (63.6%), and recreation (59.4%), were reported to be "good effects" of visitors and tourists. The primary "bad effect" created by tourists was perceived to be traffic conditions (70.6%), with a majority of respondents also observing a negative effect on the costs of land and housing (55.5%) and crime (52.1%). (See Table 4.)

Comparison of survey responses from 1986, 1988, and 1992, indicated that Vermonters were more negative regarding the effects of tourism on the creation of jobs and recreational opportunities in the state. Vermonters increasingly were less negative regarding the impacts of tourists on the costs of land and housing, traffic conditions, agriculture and farming, and on environmental quality. Respondents were more positive about the effects of tourists on Vermont's scenery, the state's values, customs, and traditions, and the overall quality of life in Vermont (Table 4). In the areas of shopping and cultural opportunities, crime, and the general cost of living, Vermonters reported relatively the same perceptions of the effects of tourists.

Statistical analysis of responses from 1988 and 1992 surveys, revealed an increasingly more positive attitude of Vermonters toward visitors to the state. Significantly fewer respondents reported negative perceptions of tourists' effects on the costs of land and housing, agriculture and farming, and environmental quality. Significantly more respondents from 1988 to 1992 reported perceived positive effects of tourists on Vermont's scenery and on the overall quality of life in the state (Table 4).

Table 4. Comparison of the perceptions of the effects of tourists (1986, 1988 & 1992).

Issue	Average[a] 1986	1988	1992
Job Opportunities	0.62	0.49	0.54
Costs of Land/Housing	-0.43	-0.61	-0.32[b]
Traffic Conditions	-0.70	-0.69	-0.62
Recreational Opportunities	0.52	0.30	0.43
Cultural Opportunities	0.62	0.55	0.60
Crime	-0.51	-0.47	-0.50
Vermont's Scenery	-0.03	-0.11	0.17[b]
Agriculture & Farming	-0.16	-0.22	-0.00[b]
General Cost of Living	-0.16	-0.32	-0.16[b]
Shopping Opportunities	0.56	0.46	0.51
Environmental Quality	-0.19	-0.30	-0.07[b]
VT Values, Customs, & Traditions	0.00	-0.12	0.04[b]
Overall Quality of Life	0.27	0.17	0.35[b]

a/ Average refers to the mean score derived from the following coding system: Good Effect=1; No Effect=0; and Bad Effect=-1.

b/ 1992 response is significantly different from 1988 response (f prob. < .05).

Respondents were asked to agree or disagree with several statements about Vermont tourists. Vermonters' attitudes toward tourists were generally positive for each item. A substantial majority (72.4%) indicated that Vermont tourists were pleasant to deal with and a similar majority (74.4%) disagreed that there were too may tourists visiting Vermont. However, substantial minorities did not agree that Vermont tourists were considerate to the environment (42.0%), and that more tourism would raise the standard of living in the state (42.1%). Comparison of responses from the 1986, 1988, and 1992 surveys revealed declining agreement with the statement that "Vermont tourists are pleasant to deal with." There was, however, more agreement with the statement that more tourism development would raise the standard of living in Vermont; this increase in agreement was found to be statistically significant from 1988 to 1992 (Table 5).

Table 5. Comparison of perceptions and attitudes about tourism (1986, 1988 & 1992).

Statement	Average[a] 1986	1988	1992
Vermont tourists are pleasant to deal with	0.61	0.61	0.50
Vermont tourists are considerate toward the environment	0.08	0.05	0.10
Vermont tourists are considerate toward Vermont residents	0.23	0.25	0.21
More tourism development will raise standard of living in Vermont	0.06	-0.12	0.15[b]
There are too many tourists in Vermont	-0.54	-0.41	-0.56

a/ Average refers to the mean score derived from the following coding system: Strongly Agree=2; Agree=1; Disagree=-1; Strongly Disagree=-2.

b/ 1992 response is significantly different from 1988 response (f prob. < .05).

Conclusions

The 1992 Vermont Recreation Survey and Environmental Index offers a unique perspective on Vermonters' perceptions regarding recreational issues and the quality of Vermont's environment. In general, Vermonters have given the quality of the state's recreational resources an average grade of a B- and a slightly better average grade of B for the quality of Vermont's environment. Vermont's scenery, as both a recreational and environmental resource, continues to be perceived by Vermonters as the state's highest quality resource--a trend that's been measured since 1986.

The quality of Vermont's water resources, as both recreational and environmental amenities, appears to be an area of concern receiving the lowest grades on the Environmental Index. Comparison of Vermonters' opinions over time indicate that while there was a significant improvement in the perceived quality of rivers and streams between 1990 and 1992, there were no significant changes reported in the perceived quality of drinking water, ground water, and lakes and ponds.

Disposal of solid and toxic wastes, along with the loss of agricultural land, acid rain and the increasing development of Vermont, are perceived to be big environmental problems for the state. While considered to be "problems," availability of outdoor recreation opportunities, air quality, overcrowding of outdoor recreation areas and conflicts between different groups of outdoor recreationists, were issues rated relatively lower in comparison to other potential environmental problems for the state.

A majority of Vermonters agreed that the state was doing well in the protection of the natural environment; however, they did not agree that future generations would enjoy a better quality environment. Vermonters indicated that they did not believe that the state's environmental laws were too strict and supported the idea that environmental protection and economic progress could go hand in hand.

In the area of recreation-related issues, Vermonters supported, relatively strongly, the concepts of community recreation paths or "greenways" for bicyclists and pedestrians, and the inclusion of adequate road shoulder in the development and improvement of roads and highways to accommodate bicyclists. Vermonters offered varying levels of support for ski industry initiatives--agreement with the development of lighted ski trails for night skiing, and disagreement with the expansion of ski areas and water withdrawal from Vermont's rivers and streams for snow-making.

Overall, Vermonters perceived the effects of visitors and tourists to the state to be positive with the creation of opportunities for jobs, cultural activities, shopping and recreation; however there was concern expressed for the impacts of tourists on traffic conditions, the costs of land and housing, and crime in Vermont.

PLANNING AND G.I.S.



IDENTIFYING CRITERIA AND ESTABLISHING PARAMETERS FOR FOREST-BASED ECOTOURISM IN NORTHERN ONTARIO, CANADA [1]

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This paper identifies the following criteria as indicators for ecotourism suitability within a Northern Ontario context: naturalness, wildlife, cultural heritage, landscape and community. A methodology is proposed which uses Geographical Information Systems (GIS) to identify ecotourism sites by linking criteria deemed important with actual landscape characteristics of Northern Ontario.

Introduction

Within the context of tourism in general, the ecotourism sector is reported to be the area experiencing the greatest growth over the past decade. Although ecotourism implies a form of tourism which fosters environmentally responsible principles, it appears that the economic benefits that can accrue from this activity have encouraged many nations to deliberately promote ecotourism within their borders. Established ecotourism destination areas are focused predominantly in the developing nations (Boo 1990; Dearden 1989; de Groot 1983; Fennell and Eagles 1990). The magnitude of the ecotourism industry is well illustrated by the reality that over 25 billion dollars are transferred from the northern to the southern hemisphere annually (Whelan 1991). Recently the growth in ecotourism has been broadened to include new destination areas in Australasia (Valentine 1992), and the remote landscapes of the polar regions (Marsh 1992). Expansion has also resulted in opportunities being sought in the less exotic temperate landscapes of the developed world, such as Northern Ontario, Canada. This latter trend has emerged in response to the potential that ecotourism may offer the economies of marginal areas, and also the realization that there may be a declining number of new exotic and rare landscapes available that can be marketed as ecotourism destination areas in the more established regions.

Early ecotourism destinations like Kenya (Olinda 1991), the Galapagos Islands (Kenchington 1989) and Thailand (Dearden and Harron 1992) have suffered extensive impacts as a result of increased numbers of tourists. In light of the above, it is imperative that only those areas which are suitable for ecotourism be developed and ensure that ecotourism criteria are matched with the resource base characteristics of the region. This paper describes a methodology to identify sites based on determining first the criteria and attributes of ecotourism and second by matching the value range of these criteria to the region's resource base inventory. The problems in defining ecotourism and identifying the linkages between ecotourism and other forms of tourism and related environmental management concepts are discussed in the context of explaining the difficulty in identifying appropriate ecotourism criteria. Next, the elements of ecotourism, suitable to Northern Ontario, are presented along with the criteria and the methodology. A final section addresses the implications of the methodology to resource managers and tourism operators.

Definition and Linkages

Ecotourism is a form of tourism which has been fraught with problems of definition. There is no unifying and generally accepted definition and many terms have been used to describe the same phenomenon. Examples include terms like nature travel (Laarman and Durst 1987), nature-oriented tourism (Durst and Ingram 1988) and special interest tourism (Inskeep 1987; Weiler and Hall 1992). Scace et al. (1992) identify over thirty-five terms that may be linked to ecotourism, such as sustainable tourism and alternative tourism. The dangers inherent in allowing definitions of ecotourism such scope, is that the term can fall prey to indiscriminate use as a catchall phrase for almost anything that links tourism with nature (Farrell and Runyan 1991).

Although there remains a lack of a universally agreed definition, the one most commonly cited is that stated by Hector Ceballos-Lascurain, who first coined the term "ecotourism" a decade ago. He defines ecotourism as "traveling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestations (both past and present) found in these areas" (Ceballos-Lascurain 1987, in Boo 1990). His definition suggests a form of tourism which is little different in effect from much of what has traditionally been regarded as wilderness recreation in North America. It says nothing about resource degradation, nothing about having positive impacts on the flora or fauna, nothing about economic impacts or benefits on local communities, and nothing about the nature of the experience or satisfaction. These ideological and value-laden attributes have been added to subsequent definitions of ecotourism, and have served to obscure rather than define the meaning of ecotourism. The abuse of the term, often for marketing purposes, has watered down its conciseness.

In light of the foregoing, it is necessary to see ecotourism as a dynamic and flexible concept, prone to change given the various settings in which it occurs (e.g. coastal regions, forested landscapes, national parks and protected areas, wildlife reserves, private land) and the range of experience sought by those traveling to such varied landscapes. In order to understand ecotourism, an adaptive approach is needed where it is understood that no one definition is suitable for all settings and that certain elements will have greater value than others given the environment that ecotourism is being promoted.

Ecotourism has been linked to many other types of tourism (e.g. sustainable tourism, alternative tourism) and ideas related to environmental management (e.g. sustainable development). There is a certain amount of similarity between ecotourism and adventure travel, the latter often viewed as a form of ecotourism that involves a higher degree of risk and possibly environmental impact. Ecotourism can be viewed as also fitting within what may be termed a sustainable development framework, addressing principles (e.g. equity, carrying capacity, conservation), planning (e.g. proactive, integrative and long term) and management (e.g. integrative, assigned responsibility). These linkages are discussed in greater detail elsewhere (Boyd and Butler 1993).

In the context of Northern Ontario, ecotourism will be fashioned by a predominantly forested setting with the presence of other

1/ Funding for this project has been provided through the Northern Ontario Development Agreement, Northern Forestry Program.

ecotourism within Northern Ontario, may be defined as "a responsible nature travel experience, that contributes to the conservation of the ecosystem while respecting the integrity of host communities and, where possible, ensuring that activities are complementary, or at least compatible, with existing resource-based uses present at the ecosystem level" (Boyd and Butler 1993; 13).

Northern Ontario as a Setting for Ecotourism

A review of the literature would suggest that the ecotourism population is, for the most part, well educated, affluent and mature. It would also appear to be sympathetic to what may be termed "green" principles, essentially those of sustainable development, small scale rather than large, traditional rather than modern resource development, non-consumptive rather than consumptive use of wildlife except by indigenous peoples, and especially in the areas they are visiting for ecotourism, protection of resources and the landscape, rather than exploitation of these features. These beliefs and attitudes, while held at varying strengths, may work against a perception of Northern Ontario as an area suitable for ecotourism to the global market, and certainly for the market in Canada and North America, which have some knowledge of Northern Ontario and its resource development history. The ecotourism population is also primarily urban in origin, and is attracted to areas which epitomize the opposite to home environment.

In many respects, Northern Ontario appears to have many of the attributes needed for the successful development of ecotourism. It is largely free from urban settlements, it has vast expanses of apparently untouched landscape, it has a rich vegetation cover, considerable wildlife, and an indigenous population which traditionally, and in some locations still does, lived off the land. As well, there has been recreational and tourist use of the area for a considerable time, and thus some basic facilities and infra-structure exist. Finally, there have been established a number of provincial parks, including waterway parks and one National park, which further the recreational-tourist presence and help to safeguard some of the natural features.

However, it should be readily apparent to a careful observer that the ecotourism in Northern Ontario will have to be somewhat different in form from that found, for example, in Latin America, Africa or Asia. While Northern Ontario does have the attributes noted above, in reality many of these factors create difficulties as well as present opportunities to the development of ecotourism. They are discussed briefly here in order to provide a background against which the identification of potential ecotourism sites can be conducted.

The urban settlement which does exist in Northern Ontario holds few attractions for the potential ecotourist. The resource development of Northern Ontario, basically forestry (and pulp/paper production), mining and trapping/hunting, are not activities which are viewed as attractive, or in the extreme cases, even as acceptable, by some ecotourists. The concept of clear cutting of forests, is not generally viewed with sympathy by the ecotourism population. As with other traditional resource activities in Northern Ontario, fur trapping does not rank high in attraction with ecotourists, even when practiced by indigenous peoples. The portrayal of the historic importance and development of this activity should be of interest, but present day trapping, limited though it is, is probably a feature to avoid in the context of ecotourism.

The recreational mix which presently occurs in Northern Ontario lends itself well to ecotourism, indeed some would argue much of it is ecotourism. Major exceptions are sport hunting and sport fishing which contribute significantly to the tourism revenue in the region. Hunting and fishing by indigenous peoples is viewed by some ecotourists as acceptable but within certain limits.

In many other regions which currently serve the ecotourism market, the indigenous population is portrayed and utilized as a major attraction to the visitors. They may be used as guides, provide accommodation in traditional villages and houses, and produce and sell native artifacts. Above all perhaps, they are "sold" as exotic, primitive, different and desirable, however inaccurate biased or racist that may be. In general such a portrayal of Northern Ontario Indian band members would be unacceptable, inaccurate and possibly conflict with the legal system. Most Indian reserves and settlements in Northern Ontario do not have the exotic appeal or attraction to ecotourists that a Thai hill tribe village might. In many cases they may not be much different from other small northern urban communities.

The physical attributes and scale of the Northern Ontario landscape make the area a prime candidate for ecotourism, but lead at the same time to problems of access and seasonality. Distance between features and the attractions in this area may be vast at times, certainly compared to some tropical eco-tourism destinations, and great variety does not frequently exist within a few miles in Northern Ontario as for example, in Costa Rica. The flora and fauna of Northern Ontario is not comparable in variety, guaranteed visibility or accessibility to many other areas currently used for ecotourism, such as the tropical rain forest or cloud forest.

These points have been noted, not to disparage the appeal of Northern Ontario to ecotourism, but to clarify some of the issues to be faced. Forms of ecotourism already exist in Northern Ontario and can undoubtedly be developed further. What is important, however, is to note that ecotourism in this area, will, by necessity, be different in many aspects, from that found in more traditional areas. The attributes of Northern Ontario must be carefully matched to the attributes and demands of ecotourism, in sympathy with the needs and preferences of the local population.

Elements and Criteria of Ecotourism Suitable for Northern Ontario

Seven key attributes are suggested as having applicability, based on the literature and past experience. Ecotourism should be:
(1) environmentally and socially responsible,
(2) focused on elements of the natural environment,
(3) managed in such a way as to have minimal environmental and social impacts,
(4) non consumptive,
(5) capable of providing desired economic benefits to local residents,
(6) compatible with other resource uses in the area, and
(7) appropriate in scale for conditions and environment.

A more detailed discussion is available elsewhere (Boyd and Butler 1993).

When defining indicators of ecotourism suitability for Northern Ontario, one major concern ought to be the "naturalness" or "pristineness" of the area under consideration. For that purpose, some recently developed ecological concepts, such as "ecosystem health" or "ecological integrity" (see Regier 1993) may be helpful. These notions are useful in attempts of operationalizing ecosystem management or sustainable resource management. In attempts towards operationalization of these concepts, several aspects need to be considered: (1) any standard for ecological integrity contains some underlying scientific assumptions and cultural biases; (2) the context of application; (3) methodological biases; (4) actual measures used (Steedman and Haider 1993). All these descriptions of ecosystem integrity point to the fact that it is a relative concept. First of all, constant changes in the natural environment make it impossible to define a correct starting point from a historic perspective. Also, only few areas remain that have not been impacted by human uses directly or indirectly, but a number of areas may exist in rather natural states, suggesting a continuum from pristine to more and more developed and altered environments. More important for resource management is the fact that several stable states can be defined along that continuum. The challenge for sustainable resource management in general, and ecotourism management in particular, is to devise strategies for maintaining such an ecological stable state while at the same time permitting tourism use in the area.

It can be argued that in Northern Ontario, only few "pristine" environments exist; also the region has been heavily logged, resource extraction is widespread, with the pervading influence of pollutants, emissions and possible man-induced climatic change on even those areas which have not been exposed to extractive activities. With respect to the area's "naturalness", the forest environment and the aquatic environment are important in terms of ecological integrity. Both are also important for tourism uses, albeit in rather different ways, depending on the type of activity. For instance, in the case of land-based activities, users/ecotourists will move through the forest and consequently be confronted with numerous detailed forest characteristics. Aquatic areas may provide important backdrops mostly in the form of scenery, but subtle changes in quality may be of comparably lesser significance. Water-based activities, on the other hand, reverses the situation with the forest merely providing the scenic backdrop for an ecotourism experience. The importance of this observation is that regardless of whether emphasis is placed on the forest or aquatic environment, the integrity of the desired setting will be much more apparent, allowing the other setting to be managed to reflect a healthier appearance. Although, "naturalness" is considered a key criterion to identify ecotourism sites, wildlife, cultural heritage, landscape and community are also suitable indicators. Table 1 lists characteristics and measures of the above mentioned criteria, where variation is expressed as absolutes or in the form of a continuum.

Table 1. Characteristics and measures of ecotourism criteria.

Characteristics	Measures	
NATURALNESS		
• Permanent settlement in area	Absent	Present
• Absence of cutting	> 10% red/white pine	>80% deciduous
• Undrained wetlands	Absence of dams	Dam
• Unmodified rivers (1)	Absence of dams	Dam
• Unmodified rivers (2)	Absence of bridges	Bridges
• Absence of intrusive sound	10 Km to near sound	1 Km
WILDLIFE		
• Suitable habitat	ARDA 1 Capability	ARDA 7
• Migration Route	On primary routeway	not on routeway
• Wintering site	Yes	No evidence
• Feeding site	Yes	No evidence
• Nature reserve	Nature reserve Provincial Park	Nat. Reserve zone Provincial Park
CULTURAL HERITAGE		
• Designated Historic Sites	Yes	None
• Historic Parks	Historical Provincial Park	Historical zone Provincial Park
• Historical Routes	Present	Absent
• Indian Reserve	Traditional desired	Modern not desired
LANDSCAPE		
• Significant feature	High relative relief >100 metres	No relief
• Viewpoints	Present	Absent
COMMUNITY		
• Not within site, but close enough to provide base, services and local population for economic benefit	5 Km	Over 20 Km
• Close enough for primary access to site(s)	Access features	No access

Source (Boyd and Butler 1993; 45-46)

Methodology

Geographical Information Systems (GIS) technology is employed in developing a three stage methodology to identify ecotourism sites. Stage one identifies those features of each criteria that can be recorded using GIS. Elements within a region can be recorded as points (e.g. mills, mines), polygons (e.g., areas of clear cut), or as lines (e.g., rivers, logging roads). Distance components involved with criteria are accommodated through placing buffers of a certain distance around features. For example, where noise may be a consideration and deterrent to ecotourism, a buffer of a certain distance (e.g., 10 kilometres) is placed around current extractive activities.

The second stage focuses in particular on determining an area's "naturalness." "Natural" here is defined to mean the present landscape which has adjusted to human interaction and modification, and given that this interaction with and modification of the landscape will vary spatially, it is also argued that there are different degrees of naturalness. An area's degree of naturalness is expressed in terms of the following seven attributes: presence or absence of permanent settlement, biophysical (vegetation) characteristics, extent of resource-related activity present, type of access, presence of wildlife, nature of recreational activity, landscape characteristics. An assumption is made here that the naturalness type found in areas is an important factor in determining what areas are best suited to different types of ecotourists and ecotourism experiences.

The methodology proposed in this stage is related to that used in similar research undertaken in Australia on the production of a national wilderness inventory, and on wilderness evaluation (Lesslie and Taylor 1985; Lesslie, Taylor and Maslen 1993; Lesslie, Mackey and Preece 1988). A value range is assigned to the various aspects of each attribute, from which an overall score can be determined. Table 2 shows an itemized list of possible scores for each attribute, a description of the various elements of each attribute and a measure to determine the score. It should be noted that not all attributes have a range from 5 to 1.

Table 2. Attribute list, scores and value range.

PRIMARY CHARACTERISTICS

Presence of Community

Score	Community Type	Population Size
5	absence of permanent settlement	0
3	unincorporated communities	1-1000
2	small towns	1001-10,000
1	urban settlements (industrial based)	>10,000

Resource-related Activity (forestry)

Score	Resource Type	% of "Area"
5	no presence of forestry activities	100 per cent
3	forestry practices I(cutover area)	<20 % cutover 30-40 yrs
2	forestry practices II	>20 % cutover 20-30 yrs
1	forestry practices III	>20 % cutover 10-20 yrs

Resource-related Activity (mining)

Score	Resource Type	% of "Area"
5	no presence of mining	100 per cent
3	mining practices I	abandoned mines present
1	mining practices II	operational mines present

Vegetation Coverage

Score	Vegetation Type	% of "Area"
5	mixed forest (type 1)	>50 % coniferous >10 % white & red pine
4	mixed forest (type 2)	> 50 % deciduous/coniferous, < 10 % white or red pine
3	dense coniferous forest	> 80 % jack pine, black spruce,
2	sparse coniferous forest burns and cutover i.e. all others except	> 80 % deciduous, > 10 years old
1	poorly vegetated areas, clearcuts, burns	shrub cover, < 10 years old

Access Characteristics

Score	Type	Value Range
5	access area I	areas outside of any buffers around all roads
3	access area II	areas within 2Km buffer around logging roads
2	access area III	areas within 5Km buffer around loose surface roads
1	access area IV	areas within 10 Km buffer around paved/major roads

Wildlife Setting

Score	Type	Value Range
5	wildlife setting I	ARDA class areas 1-2
3	wildlife setting II	ARDA class areas 3-5
1	wildlife setting III	ARDA class areas 6-7

SECONDARY CHARACTERISTICS

Landscape (Relative relief)

Score	Characteristic	Measure
5	high relative relief	> 25 metres
3	medium relative relief	10-25 metres
1	little relative relief	less than 10 metres

Landscape (Water content)

Score	Characteristic	% of "Area"
5	presence of water	5-20 %
3	presence of water	20-50 %
1	presence of water	0-5% or > 50 %

Source (Boyd and Butler 1994)

The absence of one or more units is used to illustrate the relative importance of a feature being absent or present, and to distinguish between aspects that are favorable to ecotourism and those which are not.

An area's type and degree of naturalness will be determined by the cumulative score it receives for all of the attributes/ biophysical characteristics present for respective areas.

The following scores are suggested for various types of naturalness.

Type of Naturalness	Score Range anticipated/accepted
I	31 to 35
II	21 to 30
III	15 to 20
IV	8 to 14
V	1 to 7

A veto system is employed in classifying areas. A type I area is not possible if a score of 3 is recorded for two or more attributes present within the area. Type II landscapes require that no more than two attributes/characteristics have a score less than three, with at least one attribute scoring a 5. A type III landscape is not possible if a score of lower than 2 is recorded for three or more attributes. A type IV is not possible if an area scores a 1 for more than three attributes.

The third stage of the methodology arranges the naturalness attributes in a hierarchical order, with vegetation cover representing the base layer. Separate overlays of the remaining attributes are added to this base layer in a sequence to generate areas where a mix of attributes are present that are suitable to ecotourism. The following order is suggested: resource-related activities, access, communities, wildlife, and landscape. If, when using this sequence, too few areas are found, the order of the thematic layers may be rearranged. Areas which receive a type I and II classification, which include components of cultural heritage could then be considered as the best option for eco-tourism. The next best option areas would be those classed as a type III landscape, with some evidence of cultural features. It is also important that the areas that are identified are of a minimum size sufficient for ecotourism. An area of between 300 and 500 square kilometres is considered as suitable, allowing for several days travel to occur with a diversity of flora and fauna present. In areas where few areas of this size are identified, smaller areas may be considered as suitable for an ecotourism opportunity/ experience which are offered as day excursions or with the added attraction of an overnight stay.

Conclusion and Implications

This paper has described a methodology to identify ecotourism sites within Northern Ontario. The nature of the methodology is such that, given the availability of GIS technology, it can be applied in other similar settings. Being able to identify areas by matching the characteristics of an area with those attributes most appropriate for ecotourism has major implications in general to tourism operators and recreation planners. As mentioned earlier, ecotourism by its very nature will have an impact on any environment. Limiting ecotourism, which has within it the potential to become mass tourism on a small scale, to such areas where the region's characteristics are most suited for ecotourism and which can best withstand such use, will to an extent reduce impacts compared to areas which are more fragile in nature.

It should, however, be pointed out that GIS is not a decision-making tool but rather provides information in a form from which decisions can be made. If areas which have high potential for ecotourism are to be developed, it will require co-operation and consultation between agencies, communities, and industry in order to make decisions which are based on the interests of the various groups involved and in line with the characteristics of the area itself. The methodology described in this paper identifies for decision-makers those areas which show the greatest potential and which then may be developed through fostering co-operative partnerships.

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BOATING OPPORTUNITIES:

A GEOGRAPHICAL ANALYSIS OF TRAVEL

PATTERNS AND MOTIVATIONS

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Pleasure boating is a major recreation activity today. In Massachusetts alone, there are more than 100,000 registered pleasure boats. Optimizing the availability of boating resources on inland and coastal waters is a major concern for recreation managers. The purpose of this paper is to explore where boating recreation may take place and the motivating factors that influence the destination choice.

Introduction

Pleasure boating is a major outdoor recreational activity in America today. It involves millions in the population across the country. In just Massachusetts alone there are nearly 150,000 boats registered. Recreation managers, as well as associated private-sector interests, are concerned with optimizing the availability of boating resources on inland and coastal waters. Knowledge of the travel behavior, site choice process, and preferred activities is key to better accommodating the needs of boaters.

The purpose of this study was to examine the boating destinations of a sample of representative pleasure boat owners in Massachusetts in order to better understand the typical travel patterns to boating sites, the factors influencing site choice, and the specific boating-related activities undertaken at different sites.

Literature Review

Boating is a very popular form of recreation. All recent nationwide and regional studies have shown an increase in participation (cf. Clawson and Van Doran 1984; USDI 1986; PCAO 1986; Kelly 1987; Warnick and Vander Stoep 1990). While Kelly (1987) and Warnick and Vander Stoep (1990) believe this growth to be dependent on the economy and demographics, Clawson and Van Doran (1984) found boating was highly dependent on fuel prices and therefore elastic. Yet today, since the fuel prices have stabilized, any visit to a water body during the summer will highlight the enormous use.

One primary issue for water based resource managers is that increased boating use may create conflicts on site. Therefore it is important to understand the factors that influence boating demand. Once identified, managers can administer resources in an efficient manner.

Recognizing the classic Lancaster (1966) approach to consumer behavior, recreation planners have sought to identify what factors influence choice behavior. Typically recreation demand models have considered socio-economic/ demographics and site characteristics to forecast recreation choice. Lately researchers have begun to define recreation choice as a function of activity (purpose of trip), travel patterns and lastly resource distribution and amenities. Each of these components will be discussed below.

It is quite obvious that boating requires water resources. The act of boating will often include a variety of secondary activities, since the boat serves as a mode of transport. These secondary activities may dictate the type of boat one utilizes, i.e., a high horsepower engine is required for water skiing, while not for an angler. Boating typically takes places within the confines of limited bodies of water, although coastal states have the added waters of oceans. This carrying capacity issue has been evaluated for similar coastal states like Maryland. Here the researchers found that the capacity of tidal waters was dependent on whether or not the boater utilized motors (Roy Mann 1976). That is, water skiers towed behind a boat need more space than someone merely swimming from a boat. Clearly boating activity takes on a variety of forms.

The travel for boating next needs to be considered. Regional planners need to evaluate system wide resources to efficiently allocate public expenditures (Cordell et al. 1983). Research at the regional scale has concentrated on boating participation at various park resources. For example, boaters have been thought of as individuals that tend to participate close to home. Stynes (1982) found that 50% of the Great Lakes residents traveled less than 30 minutes to boat. Graefe (1986), in his literature review for the President's Commission on Americans Outdoors found a similar trend in boating travel.

An earlier study by Lentnek et al. (1969) disaggregated this travel behavior further and found that sailors and water skiers had the greatest distance decay function, whereas anglers and non-specialized boaters sought more remote lakes to visit. This is a fairly important distinction since recreational boaters will have different purposes in mind when selecting a resource to visit.

Ditton and his colleagues concurred since "(fishing in a stream is quite unlike trolling in Lake Michigan..." (Ditton et al. 1975:292). Therefore, specific activities are found at specific resources which in turn, directs recreators to seek alternative destinations for alternative activities. Beyond biophysical resource characteristics, facilities nearby may prove to be significant attractants to participation (McCool 1978).

But as researchers have long known, it is not what is found at the resource, but rather what is perceived to be there that influences demand. Recreation choice can be a function of attitudes or motivations and was found to be a primary influence on recreation site selection (Murphy 1975). Linked obviously to site characteristics, motivations can direct the recreator to select one site over another.

While not directly explored, motivations can be measured in the Hernandez and Sanchez (1987) study of boating behavior in Puerto Rico. The authors found travel to be concentrated at a few primary lakes with some diversification at competing inland waters when the recreators sought some variety. Apparently, boating enthusiasts may be motivated to seek different destinations depending on these primary and secondary activities.

Research by Bristow, Klar and Warnick (1992) discovered that Massachusetts residents typically participated in a variety of activities. The activities chosen were found to influence the variety of destinations visited. When all boating activities were aggregated together (i.e., power boaters, canoe, sailing etc.) the sample evaluated indicated a propensity to diversify travel. Statewide the modal number of resources visited was three per year, indicating boaters in Massachusetts to exhibit variety seeking behavior. But when boaters were asked about other tourist travel and visiting parks, there was a tendency to repeatedly visit the same resource, indicating some level of resource dependency. Secondary activity selection apparently curtailed diversified travel, by perhaps narrowing the choice to fewer sites.

In a subsequent study, Bristow, Caron and Green (1993) more closely investigated the relationships between the demand for boating and the available supply characteristics for the activity. Certain areas in the Commonwealth were found to have an excess

supply of opportunities, while other regions failed to meet the local demand. Local demand was considered to be the most important factors since most boating takes place close to home. Areas where local demand exceeded local demand were found in the suburbs of Boston, much of Plymouth County and the Northern portion of the Connecticut River Valley. While this is important at the aggregate level, specific reasons for this behavior could only be speculated.

Questions arose, for example, when travel patterns were examined. First, since all boating was grouped together, subtle differences between different boaters could not be identified. Large boats obviously, were inappropriate on some smaller bodies of water. Second, other purposes of the trip or ancillary activities may influence the destinations selected. Anglers may seek their favorite fishing hole while a racer may select a wide open stretch of water. Third, specific site characteristics may motivate the boater to visit a particular lake.

Methodology

The survey instrument constructed for this study included roughly fifty separate data items. The procedure employed to write, pretest and evaluate the instrument followed Dillman's (1978) suggestions.

The first several items were background items dealing with boat characteristics such as boat type and engine horsepower; data for these initial items were provided together with boat owner names and addresses, courtesy of the Division of Law Enforcement, Commonwealth of Massachusetts. These background questions were followed by the questions identifying boat use over the past year and boat mooring location.

The remaining questions, comprising the bulk of the survey instrument, dealt with boater evaluations of their three most visited boating sites over the past year. First, pleasure boaters were asked to identify the importance of each of six different factors potentially influencing their motivations to select each respective boating site. The six factors included here were "nearness to home," "water body size," "nearby facilities," "water cleanliness," "mooring/ramp fees," and "fishing quality."

Next, boaters were asked to identify the frequency with which they engaged in each of five different potential boating activities at each respective boating site. Specifically, the five identified boating activities were "fishing," "swimming," "skiing/boarding," "picnics/parties," and "sightseeing."

The final survey item was an open-ended question intended to solicit other comments, positive or negative, regarding boating in Massachusetts. A copy of the actual survey instrument is included in the Appendix.

Data Collection

The survey instrument described above was administered by telephone in November, 1993 to a stratified random sample of pleasure boat owners registered in the Commonwealth of Massachusetts. As previously noted, complete, current computer listing of registered boat owners was provided through the courtesy of the Division of Law Enforcement, Commonwealth of Massachusetts.

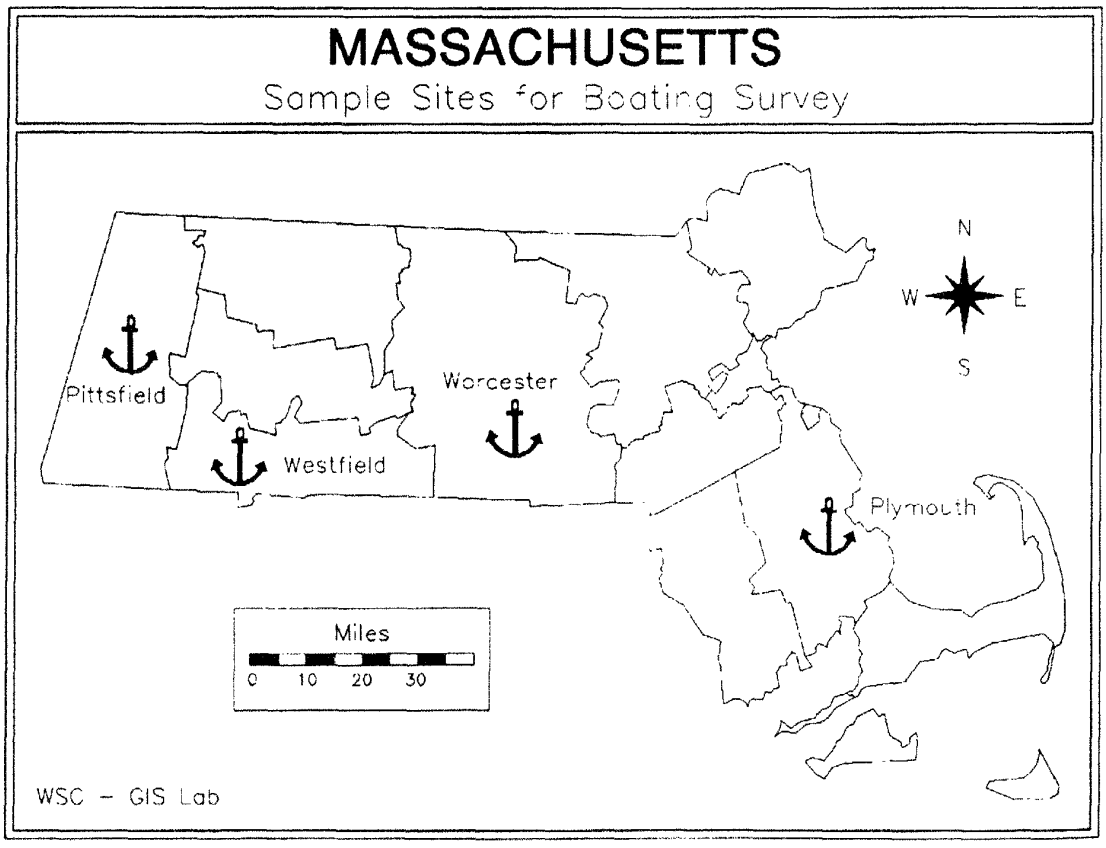


Figure 1. Locations of four sampled cities in Massachusetts.

In order to discern overall recreational boating use patterns as well as any potential city-to-city differences, boat owners from four cities spread across the state comprised the population for the study. The locations of the four targeted cities, Pittsfield, Westfield, Worcester, and Plymouth, are shown in Figure 1. Randomly-selected boat owners from each city were selected and interviewed, until a desired fifty-participant tally was reached for each of the four cities. As is typical with telephone surveys (Dillman 1978), there were difficulties contacting some boat owners because of unlisted phone numbers, telephone answering machines, changes of residence, or simply refusal to participate. In sum, a respectable overall response rate of 21.2% (200/942) was achieved, and a good 59.2% rate of participation (200/338) was elicited from among the boat owners with whom phone contact was actually established, as shown in Table 1. It should be noted that no attempt was made in this study to explore the nature of the non-responding segment of the sample; this non-responsive group was not deemed a priority since boat owner demographics were not emphasized in the study.

Table 1. Boating Survey Responses.

	Pittsfield	Westfield	Worcester	Plymouth	Totals
Total Boats	1353	1321	2330	1584	144233
Total Checked on Random No List	214	222	288	218	942
Number of Different Numbers Called	93	137	136	128	494
Number of Owners Actually Contacted	68	84	87	99	338
Number of Surveys Actually Completed	50	50	50	50	200

The tabulation of the survey responses and the subsequent analyses of the data was done using SPSS/PC+.

Findings

Boat Type, size and Propulsion

Typically, the surveyed pleasure boaters were owners of relatively small, open, outboard-powered watercraft. Among all the participating boat owners, 82% reported their boat to be of the "open boat" type. The most commonly reported boat lengths were 14, 12, and 16-foot crafts which together accounted for 46.3% of the boats; similarly, the mean reported boat length was 16.34 feet. As one would expect, the overwhelming majority of these boats, (72%) were powered by outboard engines. Reported engine sizes varied widely but the most common were the 40-horsepower and the 10-horsepower sizes.

Boat Mooring

Boating issues involving location and travel were central to this study, and it was important to determine where boat owners tend to lodge their watercraft. On this item, 80.0% of the respondents reported that their boat was kept at home, while 19.5% of those surveyed noted that their boat was moored away from home.

Multiple Boating Sites

In the survey boat owners were asked to identify the three boating sites which they had used most frequently during the past year. Here, it was found that very few boat owners had visited three different launching sites during the past year, and less than one-half of owners had utilized even two different sites. Only 41.5% of the responding owners had launched their boat from a second site, and a scant 8.0% reported using a third boating site.

Distance Traveled

In general, pleasure boaters do not travel widely when seeking boating sites. The survey results showed that most boaters traveled only short to moderate distances to access their primary boating site, and they traveled only slightly farther typically when utilizing a secondary boating site. The median reported travel distance for trips to a primary boating site was 8 miles, while the median travel distance for trips to a secondary site was 10 miles.

Fully 37.7% of the owners identified their primary boating site as involving virtually no travel, i.e., being located in their home town. More than one-half of the survey group (52.3%) said they traveled ten miles or less to reach their primary boating site, and 75.9% identified a primary boating site within twenty miles.

Home town sites involving little or no travel were identified as secondary sites by 21.6% of these respondents. Secondary site trips of ten miles or less were noted by 51.1% of the respondents, while secondary site travel of twenty miles or less accounted for 67.0% of the survey participants.

In short, hometown boating trips are quite common. In fact, the hometown is the most used boating site for more than one-third of Massachusetts boaters. The distances traveled to secondary boating sites are only slightly greater than the distances traveled to primary boating sites; furthermore, the increased distance for secondary sites is largely a reflection of the "occasional out-of-state" vacation boating trip.

Motivations for Choosing Boating Sites

Survey participants were asked to evaluate as "Not Important," "Somewhat Important," or "Very Important" each of a series of motivating factors thought to have potential importance in the choice of specific boating sites. The six examined factors were: nearness to home, water body size, availability of nearby facilities, water cleanliness, mooring or ramp fees, and fishing quality.

Primary Site Motivations

Looking first at these items for just the primary boating site, the issues which were most often ranked as "very important" by sizable percentages of the respondents were "Water Cleanliness" (68.0% of respondents), "Fishing Quality" (56.5%), and "Nearness to Home" (46.0%). A smaller portion of the survey participants, (29.5%), identified the "Water Body Size" factor as being "very important." Lastly, "Mooring or Ramp Fees" and "Availability of Nearby Facilities" were found to be of little consequence; on these respective items only 14.5% and 17.0% of the respondents cited them as "very important." The survey items are found in Table 2.

Secondary Site Motivations

Now focusing on the motivations influencing the choice of a secondary site, the items which were most often ranked as "very

important" by sizable percentages of the respondents were "Water Cleanliness" (64.0% of respondents), "Fishing Quality" (64.0% of respondents), and "Water Body Size" (37.1% of respondents). A smaller portion of the survey participants, (32.6%), identified the "Nearness to Home" factor as being "very important". Again, as before with the primary site criteria, "Mooring or Ramp Fees" and "Availability of Nearby Facilities" were found to be of little consequence; on these respective items only 18.0% and 27.0% of the respondents cited them as "very important".

Table 2. Percent of respondents citing "very important" motivations.

Motivations	At Primary Site	At Secondary Site
Water cleanliness	68.0%	64.0%
Fishing quality	56.5%	64.0%
Nearness to home	46.0%	32.6%
Water body size	29.5%	37.1%
Mooring/ramp fees	14.5%	18.0%
Nearby facilities	17.0%	27.0%

In short, when choosing their primary site the criteria of most importance to boaters were clean water, fishing quality, and proximity to home--in that order. These criteria changed only slightly when boaters sought an alternative site; here the important factors, in order, were clean water, fishing quality, and water body size.

Activities Associated with Primary and Secondary Sites
To explore the reasons people go boating, this study investigated activity selection (see Table 3). It was hypothesized that these secondary activities may have a great influence on site selection and should be identified.

Table 3. Percent of respondents reporting doing activity "often."

Activity	At Primary Site	At Secondary Site
Fishing	51.3%	64.0%
Swimming	23.5%	19.1%
Sightseeing	20.7%	26.1%
Picnics/Parties	17.6%	18.0%
Skiing/Boarding	14.6%	2.5%

By a wide margin, "Fishing" was the most popular activity associated with boating at the primary site. More than one-half (51.3%) of the boaters said they engaged in fishing "often" at their primary site. About one-fifth of the boaters reported swimming, sightseeing, and picnics and parties as activities done often at their primary boating site. Water skiing or boarding activity was reported as done often at the primary boating site by only 14.6% of the surveyed boaters.

Fishing remains popular for boaters seeking alternative sites for the experience. The other activities remained equally important to those identified with primary site selection. An interesting increase is observed in sightseeing, where a slight increase (26.1%) is observed. Could this be an indication of variety seeking behavior?

The relative overall importance of fishing discovered in the analysis led to the further disaggregation of the data. Here, the importance of site specific attributes of the primary boating site was separated for the anglers. Obviously anglers are more motivated by water and fishing factors. The issues which were most often ranked as "very important" by sizable percentages of the anglers were "Fishing Quality" (85.4%), "Water Cleanliness" (68.9%), and "Nearness to Home" (40.8%). A smaller portion of the anglers, (29.1%), identified the "Water Body Size" factor as being "very important." Lastly, "Mooring or Ramp Fees" and "Availability of Nearby Facilities" were found to be of little consequence; on these respective items only 14.6% and 16.5% of the respondents cited them as "very important".

Lastly, the participation in other activities was summarized for the anglers. Of the anglers who indicated a propensity to fish often, sixty four percent never swam. A similar percentage was found for Picnic activities (65%). Water skiers were even less likely to fish often (82.5%), while pleasure use (or sightseeing) was never done by fifty four percent of the anglers. The is a distinct difference between the activities people participate while boating. The need for high horsepower engines is needed for water skiing, while perhaps unnecessary for a typical angler.

Implications to Managers

Recreation managers and in particular those with water resources are concerned with providing a safe and enjoyable environment for boaters. An understanding of motivations and client travel can aid in meeting those needs. Boating cannot be investigated unless the secondary activities are identified. Water quality is favored by all aquatic users, but more critical in the motivations of swimmers and anglers who may come in direct contact.

Proximity to the resource was found to be of less importance to boaters in Massachusetts, perhaps because the state enjoys an abundance of inland and coastal waters. Ramp fees and support facilities were also not important. The fees must be an accepted expense and the supporting infrastructure unnecessary for the angler who packs a cooler.

Massachusetts can expand the boating opportunities by opening up many of the reservoirs in the state that are closed to recreation use. This is an untapped resource that can reduce the impact on the existing resources.

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Figure 2. Copy of phone survey.

MASSACHUSETTS BOAT-OWNERS SURVEY

ID Code # __ __ __ Name _____

Phone _____ Street & Town _____

Boat Type 1=Open Boat 2=Cabin Cruiser 3= Sailboat 4=other Boat Length ___ ___ ft

Propulsion 0=None 1=Outboard 2=Inboard Motor Horsepower ___ ___ ___

Where is Boat Moored 1=at home 2=away...town name _____

****

Hello, my name is _____ and I'm calling from the Regional Planning Department at Westfield State College. We are conducting a telephone survey of registered boat owners in Massachusetts--to better understand the needs of boaters and to improve boating opportunities in the State. We would appreciate your responses to some questions about your own boating, particularly this past year...

1.During the past year did you use the boat described above? 1=Yes 2=No

2.Where do you generally keep this boat?

1=at main residence 2=at cottage 3=at marina 4=other...where? _____

Now I have some questions about the places you went boating this past year.

First, thinking of just this past year, what was the boat launching SITE USED MOST OFTEN?

3.Where Is the Site? _____ (Site & Town)

4.Number of Days Used This Past Year? __ __ __ (Number) (Miles from Home: __ __ __)

When you chose this particular boating site, how important was--

5. Nearness to Home	0=Not Important	1=Somewhat Important	2=Very Important
6. Water Body Size	0=Not Important	1=Somewhat Important	2=Very Important
7. Nearby Facilities	0=Not Important	1=Somewhat Important	2=Very Important
8. Water Cleanliness	0=Not Important	1=Somewhat Important	2=Very Important
9. Mooring/Ramp Fees	0=Not Important	1=Somewhat Important	2=Very Important
10. Fishing Quality	0=Not Important	1=Somewhat Important	2=Very Important

At this particular boating site, how often did you use your boat for--

11. Fishing	0=Never	1=Seldom	2=Occasionally	3=Often
12. Swimming	0=Never	1=Seldom	2=Occasionally	3=Often
13. Skiing/Boarding	0=Never	1=Seldom	2=Occasionally	3=Often
14. Picnics/Parties	0=Never	1=Seldom	2=Occasionally	3=Often
15. Sightseeing	0=Never	1=Seldom	2=Occasionally	3=Often

Now, let's think about the boat launching SITE that you used 2nd MOST OFTEN this past year--

16.Where Is the Site? _____ (Site & Town)

17.Number of Days Used This Past Year? __ __ __ (Number) (Miles from Home: __ __ __)

When you chose this particular boating site, how important was--

18. Nearness to Home	0=Not Important	1=Somewhat Important	2=Very Important
19. Water Body Size	0=Not Important	1=Somewhat Important	2=Very Important
20. Nearby Facilities	0=Not Important	1=Somewhat Important	2=Very Important
21. Water Cleanliness	0=Not Important	1=Somewhat Important	2=Very Important
22. Mooring/Ramp Fees	0=Not Important	1=Somewhat Important	2=Very Important
23. Fishing Quality	0=Not Important	1=Somewhat Important	2=Very Important

At this particular boating site, how often did you use your boat for--

24. Fishing	0=Never	1=Seldom	2=Occasionally	3=Often
25. Swimming	0=Never	1=Seldom	2=Occasionally	3=Often
26. Skiing/Boarding	0=Never	1=Seldom	2=Occasionally	3=Often
27. Picnics/Parties	0=Never	1=Seldom	2=Occasionally	3=Often
28. Sightseeing	0=Never	1=Seldom	2=Occasionally	3=Often

We are nearly done with the questions. Are there any other boat launching sites that you used this past year. If so, think of the SITE that you used 3rd MOST OFTEN this past year--

29.Where Is the Site? _____ (Site & Town)

30.Number of Days Used This Past Year? __ __ __ (Number) (Miles from Home: __ __ __)

When you chose this particular boating site, how important was--

31. Nearness to Home	0=Not Important	1=Somewhat Important	2=Very Important
32. Water Body Size	0=Not Important	1=Somewhat Important	2=Very Important
33. Nearby Facilities	0=Not Important	1=Somewhat Important	2=Very Important
34. Water Cleanliness	0=Not Important	1=Somewhat Important	2=Very Important
35. Mooring/Ramp Fees	0=Not Important	1=Somewhat Important	2=Very Important
36. Fishing Quality	0=Not Important	1=Somewhat Important	2=Very Important

At this particular boating site, how often did you use your boat for--

37. Fishing	0=Never	1=Seldom	2=Occasionally	3=Often
38. Swimming	0=Never	1=Seldom	2=Occasionally	3=Often
39. Skiing/Boarding	0=Never	1=Seldom	2=Occasionally	3=Often
40. Picnics/Parties	0=Never	1=Seldom	2=Occasionally	3=Often
41. Sightseeing	0=Never	1=Seldom	2=Occasionally	3=Often

42. This survey has largely dealt with the places you boat most often. Are there any other comments that you would like to make about boating in Massachusetts? If so, what--

_____

_____

_____

THANK YOU FOR YOUR VOLUNTARY PARTICIPATION IN THIS SURVEY.

PANEL DISCUSSIONS

PARTNERSHIPS
CHANGES IN FEDERAL AGENCIES



PARTNERSHIPS PANEL:

THE USE OF CONTRACTORS AND PARTNERSHIPS IN PUBLIC FOREST RECREATION: SOME CONSIDERATIONS

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This paper argues that short term competitive contracting and "partnerships" with low bidders cannot produce the quality or efficiency that highly socialized normatively guided career organizations, both public and private, can produce. High quality maximum efficiency production requires highly socialized primary group types of organizations, guided by a *moral* rather than a calculative or alienated involvement with the organization. Only an organization which gives the ownership of the work process to the workers, creating a sense of "family", can produce an occupational group which socializes both on and off the job. This type of social group can provide the pure moral or social moral involvement in the organization necessary to achieve both high quality *and* efficiency. The Japanese management style developed by W. Edward Deming's *Total Quality Management* is one of the best ways to develop work ownership by the occupational group, and provides the pure moral or social moral involvement in the organization necessary for both high quality and efficiency.

Introduction

Public recreation agencies must face smaller budgets yet greater demand for certain services, even some unique services. This has led to a reliance on more and more contracted for services provided by private business such as general contractors, concessionaires and more recently relationships called "partnerships." (Dulac USFS, 1987).

These private services, contracted for by federal and state recreation agencies, presumably supply a public recreation need at a cost less than that which would be incurred if the service was provided by career and seasonal government agency employees. Savings are said to be obtained by avoiding the costs of health insurance, retirement, end-of-the-fiscal-year spending sprees, classified salary scales, and so forth, by hiring contractors who bid competitively for the right to provide a service.

Selin has argued from a selected sample of three National Forest *partnerships*, that "successful" relationships were "...marked by the following characteristics: a shared vision; be realistic (sic); have the right people; have support from the boss; plan continuously; meet often; share information and ideas; never say die; give a little; and set new goals" (Chavez 1993). However, to this writer, conceiving of shared vision and goals between a government bureaucracy and an entrepreneurial firm is oxymoronic.

Motives of "Partners"

On the one hand, a "partner" is a private firm with a long term government contract, and thus is a temporary monopolist. This firm has no fear of competition until its contract is up for renewal. Therefore, it necessarily must seek to maximize its net worth constrained by the limits on its prices and services set by the contract. It can make a maximum profit only by charging as much as possible while providing the minimum service possible short of sanctions decided on by the government. (And those can often be avoided by bringing social or political pressure on the agency). It has no incentive to produce quality other than the threat of penalties under the contract, and the threat of non-renewal of the contract (after the contract period of from sometimes ten to thirty years). And it is probably not operating under a performance bond, as required of most construction contractors doing work for the government. Furthermore, in order to help out or maintain the welfare of a financially weak contractor, or because of other types of collusion, the "partner" firm may even be allowed or encouraged, by the contracting agency, to deviate from applicable federal criminal law.

The firm under contract thus has considerable incentive to "meet often" with contract compliance inspectors, in order to develop personal relationships with them, and in order to apply social or political pressure to encourage the agency inspectors to be "realistic" and to "give a little."

Indeed, such a firm has an incentive not only to cut corners wherever possible (as shown recently in the timber theft and fraud cases in Oregon), it may begin to "stretch" the contract a little at first, and if not penalized by the agency, it may use its working relationship with the agency inspectors to illegally but significantly add to its profits. Of course, if the agency inspectors do become *that* "realistic" and continue to "give a little," the quality of public service provided by the contractor is bound to suffer. (see Turner, Charles H.; U.S. Attorney, Oregon [ret.], 1993)

Public Support

On the other hand, a government bureau is competing each year with other public agencies for Congressional appropriations, which hopefully constitute an increasing (but at least a stable) share of the public treasury. Thus, the bureau must maximize all possible public support *every* year. It cannot risk having one part of its clientele happy with its services and its other clientele unhappy. It cannot risk having its clientele numbers decline. And in order to avoid unhappiness and decline in its appropriations, staffing and authority, it must provide a unique, identifiable and memorable service or product to all its clientele publics. It can ill afford to share its political image and support with private firms acting on behalf of the agency.

However, the primary motivation of contractors with natural resource agencies is not public support. It is to make a profit on their investment (normally more than 10%). Quality service to agency publics (which might help the agency maximize public support) is a lower priority with a contractor. A contractor's profit often does require "cutting corners" on what is provided. And this is achieved many times by adhering to the minimum (or less) in contract established standards, by cost saving measures in the quality and quantity of personnel providing services, and by savings in product quantities and quality.

In addition, contractor personnel may be less than good ambassadors for the contracting government agency, and by not having the motivation for maximizing public support they may even behave so as to alienate potential agency supporters. This occurs not only because of different motivations, but because of a climate of fear created in the contracted for service organization. This fear stems from the contracted firm members' desires to protect their jobs by saving money, rather than providing complete production of the contracted services. And the problem of fear is compounded by employees who fear job loss because tenure or civil service fails to protect them from profit enhancing cutbacks by their firms. No matter, we have been told a "shared vision" between government officials and a contractor constitutes "success," and thus is both a possible and viable goal for each.

The Public Interest

In the Oregon experience with agency contractors mentioned above, the "shared vision" became one of seeing major fraud and theft of public property and funds as merely "mistakes" by contractors and agency officials. Rather than enforce the contract or the public law, the agency argued that "anyone can make a mistake" (Turner, Charles; U.S. Attorney, Oregon [ret.], Testimony before House Subcommittee on Civil Service, October

19, 1993.) There, one to one contracting relationships became more important than protecting the public welfare. According to Turner's testimony (further substantiated through a personal interview with the author 12/1/93), this kind of "shared vision" behavior on the part of federal agency contract inspectors (and their supervisors), being "realistic," having "the right people," and giving "a little" may not constitute success for the public welfare. On the contrary, it can lead to biasing agency management programs in favor of one particular clientele group (the contractors), violation of the public trust, and considerable loss of funds to the federal treasury.

And acknowledgment of this biasing does not even begin to deal with the problem created by fear within the contractor's organization.

Fear

The problem of fear in the loss of quality has been noted by total quality management specialist W. Edward Deming, who has observed that fear impairs performance and fear generates inaccurate data (see Walton, 1990). He observed that fear makes workers do what is necessary to protect their jobs, not what is in the organization's long term best interest or mission statement. Deming also noted that fear exists at all levels of such organizations, and may be greatest at the top of the management structure. He felt that fear in an organization that is trying to implement quality improvement is disastrous. Generating fear in an organization can cause executives to make the wrong choices based on erroneous data because employees are afraid to report the truth.

Absent or erroneous feedback from within an organization's management structure can obscure much about the quality of service an organization is producing. No one really knows what the current quality of service is except the clientele, and only the workers are in touch with them. The top management in an organization tends to make operational decisions by looking at profit or production data. If such decisions improve the quality of a system it is usually coincidental (Lyden 1992). Lyden observes that health care organizations still don't make decisions based on quality data. That kind of data, he points out, includes why former clients stopped using the organization's services, what jobs in the organization have the highest turnover and why; which work processes have the greatest amount of rework, delay and waste; what are the most frequent complaints of current customers; what aspects of the service that most clients would like to see improved; and how the organization's services compare to others providing the same service (1992). Hence, the importance of driving out fear in any service organization and giving the worker the ownership of the work process as part of driving out such fear.

Other Costs Of Contracting

Other costs of contracting that are not often considered include those of drafting detailed enough standards and provisions in the contract to insure that a minimum quality of service is prescribed and ensured. Ensuring contract compliance requires enforcement, regular inspections, shopping yourself, and immediate follow-up on user complaints. This policing requires costly numbers of well trained and well paid incorruptible inspectors, in order to assure that contract requirements are strictly complied with (Jubenville & Twight 1993). Contract inspectors must be highly loyal government employees who don't overlook deviations from compliance with specifications because of fear or favor. They must be well paid so that they have no incentive to accept bribes and they must be transferred at regular intervals so that personal relationships with contractors are not developed.

Turner points out the importance of contract inspectors and their supervisors not being residents of the communities depending on continued contracts with the government agency. He also points up the necessity of these personnel not having close personal relationships with members of the contractor firms, or any relationships founded on blood or marriage. Turner also discusses the conflicts of interest which occur when inspectors or their supervisors bowl with or attend church with contractor personnel who may have incentives to behave in an unethical or criminal fashion (Turner 1993, 9-10).

Recent reports by the U.S. Office of Management and Budget have pointed out that a goodly number of private firms, contracted with to replace services formerly provided by career government employees, have paid for unauthorized and at times illegal expenses. These included "tickets to sporting events, lavish cruises, and excessive salaries for executives" (Schneider 1992). Such skimming of profits must have resulted in both poorer quality service to agency clientele and excessive charges to the government.

Reiterating again, even in existing agency operations, no one (except the customer) really knows what the current quality of service is. Senior management is generally making operational decisions based on financial or productivity data. As W. Edward Deming has pointed out, if these operational decisions improve the quality of a system, it is usually purely coincidental (Lyden 1992; Walton 1990).

Furthermore, a recent study in the New York City Parks and Recreation Department reports on the use of the Deming technique of giving ownership of the work process to the workers. In a test of that technique, allowing the workers (instead of managers and engineers) to develop the work flow chart, schedule, and manning requirements for the job, a tree removal project--for which contractors would have charged more than $10,000.00, removal of 51 hazard trees cost the city only $2,644.00, a savings of more than $8000.00 (Janofsky 1992).

Finally, it is argued that career agency employees are better ambassadors for their agencies with the public than are contractors, because they are more service oriented. They see their profit in public good will, rather than as a bottom line on a low bid. This was exemplified in Glacier National Park in the mid- 1980's, where it was shown that career civil service maintenance personnel were more likely to contribute overtime services in emergency situations than were contractors. Contractors there were generally unavailable on nights or weekends and when they were available they routinely submitted requests for additional reimbursement through costly change orders (Sigler 1986).

Theory

The Glacier Park example above can be explained by the sociological studies of Etzioni (1975) who has shown that organizational involvement ranges in intensity from high to low. Etzioni refers to positive involvement as *commitment* and to negative involvement as *alienation*. Employees of any organization can be placed on an involvement continuum which ranges from an intense negative zone through mild negative and mild positive zones to a highly positive zone.

Strong Strong
Alienation < -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 > Commitment

Figure 1. Levels of organizational involvement.

Etzioni describes three zones of the involvement continuum: *alienative*, for the high alienation zone (e.g. the disgruntled union member on strike, the prisoner of war and other inmates, enlisted soldiers in basic training, etc.); the *calculative*, for the two mild zones on either side of the midpoint of the commitment scale in Figure 1 (e.g. the clock watching 8 hour worker who goes home at 5 and forgets the job, who finds non-work ego rewards in other activities such as social organizations, church or civic clubs); and finally at the top of the commitment scale the *moral* (e.g. the parishioner in his church, the devoted member of a political party, and the loyal follower of his leader).

Alienative involvement designates an intense negative orientation; Etzioni states that it also exists among merchants in "adventure" capitalism, where trade is built on isolated acts of exchange, "each side trying to maximize immediate profit" (1975, 10). He says calculative involvement is either a mildly negative or mildly positive orientation. It has a low level of intensity.

> *Calculative orientations are predominant in relationships of merchants who have continuous business contacts. Attitudes of (and toward) permanent customers are often predominantly calculative, as are relationships among entrepreneurs in modern (rational) capitalism.* (1975, 10).

Moral involvement is a high intensity positive orientation according to Etzioni. It is either pure or social in character.

> *Pure moral commitments are based on internalization of norms and identification with authority* (Etzioni, 1975 11, 169).

Moral involvement or a high level of organizational commitment is an outcome of long term socialization, such as that described in professional career bureaucracies like the U.S. Forest Service (Kaufman, 1960). (Some of the effects of such socialization were substantiated empirically among Forest Service district rangers by Twight and Lyden in 1988). The effects of socialization in career bureaucracies is perhaps best illustrated by the military officer corps in the U.S., with the most refined American example being the line officers of the U.S. Navy (Mosher, 1982, 148). Noting the effects of socialization in hierarchies such as bureaucracies, Etzioni points out that pure moral involvement tends to develop in vertical relationships such as among leaders and followers.

Social moral involvement according to Etzioni, is of lesser intensity and tends to develop in horizontal relationships like those in various types of primary groups such as the family, and in various occupational communities which have social life both on and off the job (Etzioni, 171). Such social commitment rests on sensitivity to primary group pressures for loyalty to the organization and its welfare (Gawthrop, 1969, 134-40). Thus, even non-professional members of dominantly professional career organizations are influenced by integration with the professional staff and participation in the organizational socialization process. Long term socialization is even more effective in terms of efficiency and productivity, as noted earlier, when ownership of the work process is given to career skilled workers by the professional staff (Janofsky 1992; Moore 1973). In career organizations or occupational groups which socialize on and off the job, both means and ends of the organization are geared to the needs of the collectivity in serving its goals.

However, in a calculative involvement, such as with a business contract with the government, the goals of the contracted for individuals and their organization gain the loyalty of the employee only on what Etzioni calls a remunerative- calculative basis. And if the relationship with the contract administration, the recreation opportunity providing agency, is on a *coercive compliance* basis, as with the specifications policed by the contracting agency, then loyalty to the goals of the government agency is even lower.

This relationship tends toward *alienation* and Etzioni's work suggests that resistance to compliance with contract terms develops. Lower quality work is produced and even more costly inspections and policing become necessary to maintain even minimum quality standards. The more contract violations that are found through the increased inspections, the more the supervision costs of the contractor are increased, and the more the supervision the greater the alienation of contractor employees. Workers begin to leave or be fired and new ones hired. Training costs go up. And it is seldom that quality ever rises to the level of that produced by an organization which has morally involved and committed employees.

Indeed, Hirschman (1970) has forcefully demonstrated that as quality deteriorates, clientele and organizational members leave their relationships with the agency or firm. "Revenues drop, membership declines, and management is impelled to search for ways and means to correct whatever faults have led to exit" (1970, p.4). Further, the firm's clientele or the organization's members often "...express their dissatisfaction directly to management or to some other authority to which management is subordinate (e.g. Congress) or through general protest addressed to anyone who cares to listen..."

Conclusion

As W. Edward Deming (Walton, 1990) and his results from so-called Japanese management has shown, the highest quality of production is only attained in career organizations which retain their employees long term, socializing them to be part of a primary group or organizational "family." This type of organization, where fear has been driven out, develops the social moral involvement described by Etzioni. The costs, methods and effort necessary to produce such an effective organization have recently been demonstrated by General Motors in creating its Saturn Division under Deming's guidance.

Contractors or "partnerships," being outside organizations generally composed of personnel with alienative or calculative relationships with their organization and with a contracting agency, cannot develop the loyalty and moral commitment necessary for the highest quality and most efficient production. Only an organization which socializes its employees over several years, often promoting strictly up through the ranks and selecting only young relatively malleable entry level employees with a common background, can develop the moral commitment or loyalty necessary for maximum quality production and efficiency. Hence the first years of the Saturn Division were spent on developing the socialization and team spirit prescribed by Deming, and the pre-1960 U.S. Forest Service emphasized socialization, organizational identification, the Forest Service "family", moral norms, social interaction primarily within the agency, promotion only from within, and transfers every three or four years. Once integration of Forest Service personnel and ranger stations with local lumber communities began--in the name of public relations--and transfers and moral commitment to organizational norms declined, order began to break down. Calculative and alienative relationships with the agency developed and scandals (previously unheard of--Kaufman 1960) began to appear. Timber thefts increased, fraud occurred and moral deviations otherwise known as felony level crimes began to be described as "mistakes" and mre contract slip-ups (Turner 1993).

Building a cohesive team capable of producing a quality car such as the Saturn was found to require several years of socialization and careful attention to the building of an occupational primary group according to the long practiced "Japanese" management techniques developed by W. Edward Deming (Walton, 1990).

Short term contractors who hire calculative compliance oriented employees, those who are not socialized into a normatively guided organization, can never provide the same quality work as that produced by a supportive "family" career organization (the latter does not have to rely on fear and coercion to turn out quality workmanship). And given sufficient fear and coercion, many of those calculative employees will become alienated, leading to even lower quality work.

Providing employees a sense of ownership of their work, as the New York City Parks Department has shown, produces much higher levels of efficiency and quality. It prevents the corruption and "rip-offs" of the public and the government agencies inherent in competitive short term contracts with private entrepreneurs employing calculative and sometimes alienated staff members (Schneider 1992; Janofsky 1992). And we finally have learned from the Japanese that only by relying on Deming management will we really achieve both maximum productivity and the highest quality work for the consuming public.

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PARTNERSHIPS PANEL:

THE NEW JERSEY COASTAL HERITAGE TRAIL ROUTE: A PARTNERSHIP IN ACTION

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The New Jersey Coastal Heritage Trail Route is a vehicular tourism route that is being developed to provide for public understanding and appreciation of significant natural and cultural sites associated with the coastal areas of New Jersey. Authorized by federal legislation in 1988, the Trail is a public/private partnership involving the National Park Service, state of New Jersey, units of local government, and public and private entities. The Trail region extends along nearly 300 miles of coastline. Trail themes will include Maritime History (the initial demonstration theme), Coastal Communities, Recreation and Inspiration, Wildlife Migration, and Coastal Habitats. This paper reviews the history and development of the Trail as a model for partnership efforts in managing and interpreting natural and cultural resources.

Introduction

The New Jersey Coastal Heritage Trail Route (hereafter Trail) was authorized by Congress in 1988 as a public/private partnership to provide for understanding and enjoyment of important sites associated with the coastal areas of New Jersey and to recognize their importance in the nation's history. The Trail region extends along nearly 300 miles of coastline from Perth Amboy on the Raritan Bay in the north to Cape May in the south and then northwest along the Delaware Bay shoreline to the Delaware Memorial Bridge in Deepwater (Salem County). Figure 1 shows the project area and five Trail regions.

The project exemplifies partnership programs that have become increasingly important in protecting significant natural and cultural resources. Goals of the Trail include increasing public awareness of the special coastal resources through interpretation and education, creating public advocacy for resource protection through expanded awareness of the coast's significance, and ensuring that resources are not threatened or adversely affected because of designation as part of the Trail.

The Trail is designed for vehicular touring. Because of the size and complexity of the project area, five geographic regions have been defined along the main access corridors of the Garden State Parkway which runs north and south and State Route 49 which runs east and west. Each region will eventually have a Regional Welcome Center that will act as an interpretive and informational hub. Highway directional signs will be installed to guide visitors to Trail destinations, and both Trail-wide and regional brochures will be developed. Individual sites will have interpretive exhibit panels to supplement on-site interpretation. The goal is to provide for visitor needs through existing facilities or, where none exist, through cooperating groups or agencies. The interpretive goal of the Trail is to provide opportunities for visitors to learn about and experience New Jersey's diverse coastal heritage, expand public awareness of the significance of the coast, and place New Jersey's natural and cultural heritage in a state, national, and international context. The Trail will interpret the New Jersey coast through five themes. The Maritime History theme was selected as a demonstration theme and opened to the public in September 1993.

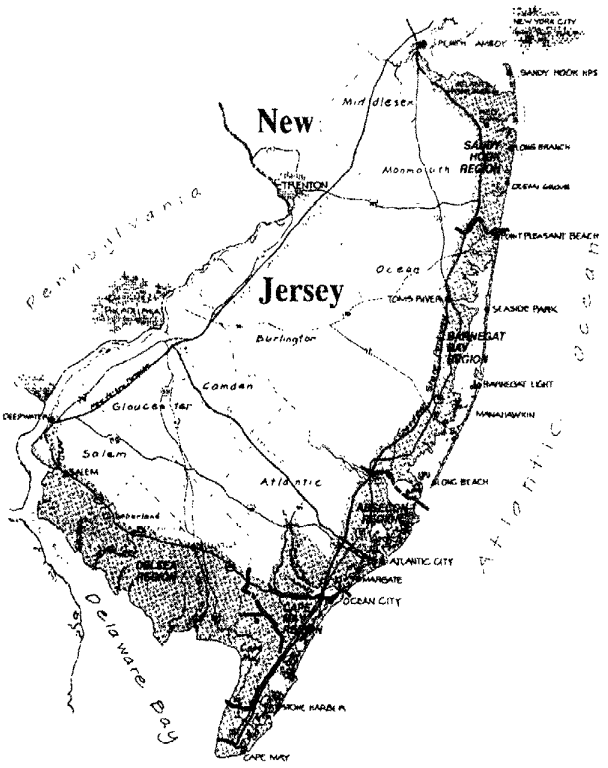


Figure 1. The New Jersey Coastal Heritage Trail Route project area showing the five Trail regions.

Participation in the Trail is voluntary. Site owners/managers submit applications to the state of New Jersey for review and determination of the site's level of significance. Selection is based on criteria for location, significance, interpretation, access, and management.

During the initial five-year implementation period, the state of New Jersey will cooperate with the National Park Service (hereafter NPS) in managing the Trail. At the end of the implementation period, the NPS and the state will assess the Trail and the state's ability to manage it. The NPS will provide long-term stability for the Trail by anchoring it in the north at the Sandy Hook unit of Gateway National Recreation Area. A special resource study of the Delaware Bay that is underway may recommend long-term NPS involvement in southern New Jersey and provide another Trail anchor.

Legislative History

The concept of the New Jersey Coastal Heritage Trail Route was introduced by Senator Bill Bradley of New Jersey who was concerned that the rich history of the New Jersey coast and the role it has played in the nation's history were not being adequately acknowledged. The organizational structure of the Trail idea was based on the premise that neither the federal nor state government could afford to protect and interpret all of the special places that can be found along the coastal region of New Jersey. Authorizing legislation (Public Law 100-515) sponsored by Bradley, Senator Frank Lautenberg, and by Congressmen William Hughes and James Saxton was passed by Congress in October 1988. The legislation directed the Secretary of the Interior acting through the Director of the NPS to designate a vehicular tour route along existing public roads linking such natural and cultural sites in New Jersey.

The legislation defined the Trail region and called for an inventory of all natural and cultural resources in the legislated project area. The inventory was to include the location and description of:

1. significant fish and wildlife habitat and other natural areas;
2. unique geographic or geologic features and significant landforms;
3. important cultural resources, including historical and archaeological resources; and
4. migration routes for raptors and other migratory birds, marine mammals, and other wildlife.

The legislation called for a general plan to include proposals for a comprehensive interpretive program and alternatives for appropriate levels of protection of significant resources. The resource inventory and general plan were to be prepared in consultation with other Federal agencies, the state of New Jersey, units of local governments, and public and private entities. Ample opportunities for public involvement were to be made available in the preparation of the inventory and interpretive plan. The Secretary of the Interior through the NPS was authorized to enter into cooperative agreements with federal, state, and local non-profit or private entities to provide technical assistance in the development of interpretive devices and conservation methods. In addition, the legislation gave the authority to erect road markers along the Trail in conjunction with the state or local entity having jurisdiction over the roads designated as part of the route. By working cooperatively--not only with other governmental agencies but also with local non-profits or private entities--the coast's unique stories could be highlighted for the traveling public.

Initial Research and Project Planning

In December 1988, the NPS began development of a resource inventory and general plan for interpreting and protecting selected resources. During the spring of 1989, the NPS study team held meetings with the New Jersey Department of Environmental Protection and Energy (hereafter DEPE) and researched resources in the project area. In April and June 1989, the project was officially launched with a series of public meetings. An inventory representing 267 entries and over 7,000 individual sites and structures was distributed for comment in November 1989.

The alternatives document was finalized as the "Study of Alternatives" and distributed in November 1990 along with the "Resource Inventory." A series of six workshops was held between November 1990 and February 1991 to gather public comments. A preferred alternative was presented to the NPS director in April 1991, and a decision was made to develop a final plan based on this alternative and to implement the project through the development of five trail themes.

Maritime History with its focus on aids to navigation, coastal defenses, fishing villages, maritime trade, and other aspects of the interdependence of people and the sea was selected as the demonstration theme. Subsequent themes will include two other historical subjects and two natural history themes. Coastal Communities will focus on the role of natural resources in shaping the economies of communities within the Trail region. Relaxation and Inspiration will address the traditions of the Jersey Shore as a destination for those seeking fun in the sun, a quiet rest, religious inspiration, and hunting and fishing activities. Coastal habitats will consider the variety of ecological habitats from sandy beaches and salt marshes to freshwater bogs and dense maritime forests that all support a wide variety of plant and animal life. Finally, Wildlife Migration will look at the international significance of the New Jersey coast as a vital stop in the global migration of many birds and sea mammals.

Workshops were held in 1991 to develop cultural and natural history themes and to develop site selection criteria. Those attending included natural and cultural resource staffs from federal, state, and local agencies and non-profit organizations. The planning team and representatives of several state agencies also reviewed formal agreements (memoranda of understanding) for use between federal and state partners. Three types of sites will be included in the Trail--those that have national or state significance and offer a full range of visitor services (level 1 sites), those that have the national or state significance but offer only limited services (level 2 sites), and those that do not have national or state significance but provide information not available elsewhere on the Trail about one of the themes (associated sites.)

Level 1 sites must be fully operational and accessible, have the necessary services to support public use (including parking, restrooms, and water fountains), be staffed and open on a regular basis (at least five hours a day five days a week, including one weekend day), provide educational programs and information to the public, and protect site resources adequately.

Level 2 sites must meet the same significance and resource protection standards as level 1 sites, but do not provide all of the same support services. They may have restricted access, limited educational programs, and/or be open fewer hours. Managers of these sites will be encouraged to upgrade services to qualify for level 1 status.

Associated sites do not meet the significance standards but effectively explain information not available elsewhere on the Trail. They must provide the same kinds of educational programs, information, and level of services as level 1 or level 2 sites. Museums not in register-eligible facilities and with important collections relating to Trail themes would be likely candidates to be associated sites.

In addition, a category of Points of Interest has been established for destinations that are primarily scenic views or sites with limited or no staffing and services but that contribute significantly to one or more of the interpretive themes.

All Trail destinations will be evaluated in an application process that verifies location of the site within the project area boundaries; accessibility from public rights-of-way; relationship to at least one of the themes; availability of or plans to implement educational/interpretive programs relating to Trail themes; presence of adequate support facilities (including parking, restrooms, and water fountains) that meet local, state, and federal regulations for health safety and physical accessibility; and significance according to one of the following criteria:

1. listing or eligibility for listing on the National Register of Historic Places or New Jersey Register of Historic Places;
2. status or eligibility for status as a national or state natural resource protection area; and
3. determination that a site is critical in representing a particular aspect of a Trail theme.

In addition, site owners or managers are required to sign an official memorandum of understanding between the site owner/manager, state of New Jersey, and the NPS; agree to operate and maintain their trail facilities; and demonstrate community endorsement of their application through municipal, county, of other governing body approval. They must periodically review the condition of Trail signs, provide information for development of a Trail annual report, promote the Trail, distribute and install interpretive materials, attend interpretive training sessions conducted or approved by the state, and educate the public about the need for protection of natural and cultural resources.

Because the Trail project area covers nearly 300 miles of coastline, it has been divided into five regions to simplify touring and make it more convenient for visitors. A map/brochure will be developed for each region showing all of the Trail-related sites by theme. A Regional Welcome Center will be established within each region near the Garden State Parkway (hereafter GSP) or State Route 49 which delineate the Trail area. The Regional Welcome Centers will provide orientation to the entire Trail and to its themes, but will highlight destinations within the region. In addition, they will also offer in-depth interpretation of one or

more Trail themes. Regional Welcome Centers must meet specific criteria regarding access, location, public services, hours of operation, and space available for audiovisual presentations and exhibits. Currently, three Interim Regional Welcome Centers have been established with an orientation video about the Trail, orientation exhibits, and Trail literature available to visitors.

To supplement the Regional Welcome Centers, a series of Local Information Centers will augment information distribution efforts. These Local Information Centers will distribute general brochures on the entire Trail and regional brochures for the region in which the center is located. They will be located in facilities such as chambers of commerce and local visitor bureaus and should assist in stimulating local interest in Trail sites and resources. Participation as a Local Information Center is voluntary and is initiated by an application to the state Division of Travel and Tourism that will review qualifications and make recommendations to the NPS. Information centers will be approved for periods of three years at which time re-application will be required. All of the Regional Welcome Centers and Local Information Centers will be located in existing or already proposed facilities that are managed and staffed by others and demonstrate the ability to support Trail activities.

The Historic American Building Survey/Historic American Engineering Record (hereafter HABS/HAER) was contracted to write overview histories of the Trail project area as well as more specific maritime and agricultural histories. The first volume in the series entitled Historic Themes and Resources within the New Jersey Coastal Heritage Trail was released in 1991 as Southern New Jersey and the Delaware Bay: Cape May, Cumberland and Salem Counties. The second volume was published in 1992 as From Marsh to Farm: The Landscape Transformation of Coastal New Jersey. Additional volumes are in development on maritime history and on the Atlantic coast region.

A trailblazer (logo) received approval in November 1991 from the New Jersey Department of Transportation (hereafter NJDOT) for use on highway signs. The logo was then sent to all counties, the Garden State Parkway Commission, and the Atlantic City Expressway Commission for approval.

Trail office staff continued to meet with various agencies and the public during the fall of 1991 to review reaction to the development alternatives and proposed themes. A newsletter was published and a series of open houses was held. The congressional delegations were briefed, and meetings were held with the staff of NPS Harpers Ferry Center to discuss development of interpretive materials.

Developing Trail Partnerships

The top destinations nationwide for the escorted tour industry are national parks, natural areas, and historic sites. In New Jersey, tourism is the number two industry generating an estimated $18 billion in travel expenditures. The state's travel industry supports 346,000 jobs and provides $7.6 billion in payroll and $2.6 billion in taxes. In 1993 there were 158.5 million trips made to or within New Jersey, of which 20 million were overnight trips.

As the Trail's planning began, two options became apparent. One was to consider the Trail as primarily a federal NPS activity that focused on existing nationally significant resources--perhaps 12-15 sites. The second option was to respond to initial public input by expanding the project to include sites of state and regional significance. This second option would require the establishment of a variety of partnerships. The goal was to look for groups already engaged in related activities that had similar or complementary agendas and for which participation would be to their advantage.

Some obvious potential partners quickly emerged. These partners were agencies already involved in tourism and the management of the state's natural and historic resources. They were the New Jersey Department of Commerce and Economic Development's Division of Travel and Tourism (hereafter T&T), the Pinelands Commission (hereafter Pinelands) which oversees the Pinelands National Reserve, and the New Jersey Department of Environmental Protection and Energy's (hereafter DEPE) Division of Parks and Forestry (hereafter DPF) which was designated as the lead coalition partner.

A conscious decision was made to involve these agencies in planning and review from the beginning so that the resulting development plan became everyone's plan and not just that of the NPS. A formal memorandum of agreement was signed with the state of New Jersey designating the responsibilities of each partner.

The NPS agreed to provide the core staff for the initial project development; assist in the resource inventory and evaluation; produce wayside and visitor center exhibits, brochures, and other interpretive materials; seek financial assistance for DPF's management of day-to-day Trail operations; prepare final implementation documents; and make final determinations for site eligibility. The DEPE agreed to provide team members and input from DPF, New Jersey Historic Preservation Office, Division of Fish, Game, and Wildlife, Office of Green Acres, and Office of Natural Lands Management; explore potential joint use of visitor centers by DEPE and the Trail; assist in devising a long-term funding and management plan; solicit site applications and participate in field reviews; and review sites for National Register eligibility.

T&T also agreed to provide a staff representative for planning purposes, supply travel and economic statistical data, locate and evaluate potential Local Information Centers, and assist in development and distribution of Trail literature. The Pinelands was to designate a representative, identify areas of cooperation for interpretive programs and visitor centers, and assist with determinations of significance for Pinelands resources.

The state partners also provided access to other groups able to assist with the development or implementation of the Trail. The Governor's Recreational Travel Committee with representation from DPF, T&T, as well as NJDOT and county engineering departments expedited the process of obtaining official approval for the logo or trailblazer to be used on highway signs. Through this committee, contacts were made with NJDOT and individual counties regarding both the storage of highway sign inventories at two locations accessible to the six participating counties and subsequent sign installation. A series of meetings was held with representatives of the Trail, NJDOT, and individual counties to verify proposed locations for installation of road signs and to determine the party responsible for sign installation.

The partnership with T&T resulted in the Trail being the focus of state tourism conferences and an agreement to handle brochure distribution through the existing state contract to state parks and tourist information centers. In addition, T&T agreed to allow centralized storage of Trail literature at its Trenton, NJ, warehouse. Agreements were also reached for the installation of orientation wayside exhibits and distribution of brochures at most service areas on the Garden State Parkway (hereafter GSP.)

The three existing interim Trail Welcome Centers are located in facilities managed by others. Two are in state parks (Cheesequake and Fort Mott) operated by the DPF. The third is in a staffed tourist information center in the Ocean View Service Area (milepost 18.3) on the GSP. T&T operates the information center in a GSP facility leased to Marriott and Mobil. Recently Mobil gave up half of its office space for an expanded Trail Welcome Center, and GSP funded and made renovations to the new space. Options are also being explored at Double Trouble State Park for joint facilities to serve DPF, Pinelands, and the Trail as a Regional Welcome Center.

For all of these Interim Welcome Centers, the focus is building on existing systems, services, and infrastructure, not on creating new ones. The NPS brings technical assistance for exhibit design and installation, while the site provides the space and staffing. In

many instances, the NPS is able to provide technical assistance to improve the site's own exhibits in addition to the exhibits relating to the Trail.

The process of building and maintaining these partnerships extends to the individual sites participating as Trail destinations. In the agreement signed with sites, the NPS agrees to provide periodic interpretive training opportunities for site employees, to supply directional trailblazer signs, to accept requests for technical assistance in the areas of interpretation and conservation of resources, to provide trail-wide orientation brochures and regional brochures, and to develop interpretive/orientation exhibits on the Trail.

In return, the sites agree to the continuing preservation of the resource covered by the agreement, to provide employees with the opportunity to attend training offered by the NPS, to make space available for the distribution of Trail literature, to display Trail interpretive exhibits, to maintain directional and trailblazer signs for the site, to provide space for the distribution of other local area tour brochures, to supply information on visitor use and Trail-related activities for an annual report, and to obtain a statement of support from the local governing authority for participation in the Trail.

Future Development of the Trail

One effective tool in maintaining support for the Trail has been a conscious effort to keep the Trail project and its partners in the public eye and to maintain a sense of progress and success through such things as periodic newsletters, giving credit to the partners, and holding mini-events at the sites. The official ceremonies opening the Trail in September 1993 involved both recognition of--and participation by--representatives of the key partners at the federal, state, and local levels. Annual meetings have been held with the Trail's official partners to review progress and solicit input for future priorities and development. Partners are also encouraged to attend and participate in Trail briefings with Congressional staff. As the Trail continues to develop, the partners will play a central role in cooperatively defining the Trail's vision as well as the long-term role of each participant.

The NPS Trail staff is constantly alert to opportunities for using the partners as a network to reach out to other individuals and organizations that can contribute to the Trail's development. The partners have been critical in successful efforts to raise additional funds through the Intermodal Surface Transportation Efficiency Act (ISTEA) for interpretive wayside exhibits. The Trail has also received support from the New Jersey Historical Commission by applying for publication grant support through the non-profit support group for one of the Trail sites. The partnerships provide the Trail with essential credibility and legitimacy that is critical in efforts to generate additional financial and political support.

State and local organizations have also used the Trail as a means of leveraging support for their own projects. Participation in the Trail has affected priorities for both staffing and capital projects at Trail sites. Groups such as bed & breakfast associations, city redevelopment groups, and county development organizations have seen the potential of the Trail in supporting their own agendas including efforts to develop eco-tourism initiatives.

Summary and Implications

The success of the Trail and its future depend on the building and nurturing of a broad range of partnerships, some formal and many informal. Like volunteers, such partnerships require a good deal of time, effort, and a certain amount of money to maintain. However, the potential benefits from such relationships far exceed what would be possible if each agency acted independently. Part of the success comes from the realization that the project can only be effective if it is based on support from the bottom up rather than being a project imposed from above. It also depends on establishing a common agenda that addresses the self interests of the partners and keeps them involved.

The Trail is a new type of partnership venture for the National Park Service. It provides a mechanism for working within existing administrative structures to bring together a broad range of established facilities managed by a variety of groups throughout coastal areas of the state of New Jersey. Selection criteria and a formal review process for applicants guarantee a certain level of staffing, state and national significance, public access, and quality of facilities and exhibits. Assistance is provided to participants wishing to improve exhibits and other educational and interpretive efforts. The Trail's interpretive themes and statewide promotional effort provide broad recognition to each facility. At the same time, interpretive exhibits at each site relate one destination to others and provide a broader context than would be possible at an individual site.

From a statewide perspective, the Trail provides a framework for recognizing and bringing to public attention the significance of the natural and cultural resources that can be found along the coast of New Jersey. By providing tourism alternatives to traditional beach activities, the Trail provides a mechanism to extend the travel season, to provide rainy day activities, and to promote additional travel activities. At the same time, it is hoped that the Trail will encourage a broader awareness of the importance of protecting the natural and historic resources of the New Jersey coast and their context within nationally and internationally significant resources.

With only the first of five interpretive themes in place and still in its first year of being open to the public, the development of the Trail is far from complete. Nevertheless, the Trail is being watched as a possible model for similar partnership ventures proposed for other regions of the country. It recognizes the inability of any single agency to preserve, protect, and interpret a region's resources and provides a possible mechanism for successful partnership efforts that can be expected to become increasingly important in the future.

PARTNERSHIPS PANEL:

NATURAL RESOURCE PARTNERSHIPS: LITERATURE SYNTHESIS AND RESEARCH AGENDA

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This paper presents a summary of an annotated bibliography on natural resource partnerships. Resource areas and management functions addressed in the partnership literature are examined. Partnership research is summarized and broken into categories including: Partnership outcomes, assessing the potential for partnerships, characteristics of successful partnerships, constraints to partnership success, and stages of partnership development. A research agenda for future partnership research is offered.

Introduction

"Partnerships have become a way of life. You simply don't have any choice if you want to get things done."
Bureau of Land Management employee

In this era of reinventing government, many natural resource managers are turning to partnerships to stretch limited tax dollars while attempting to meet the expanding public demand for quality recreation opportunities. Managers entering the murky world of cooperative agreements, memorandums of understanding, and challenge-cost share arrangements usually navigate by instinct and gut feelings. But, help is on the way. An emerging body of literature in the natural resource management field as well as in the management sciences is beginning to establish some general principles and guidelines for initiating and sustaining effective partnerships. The following literature review is based on an annotated bibliography of partnership-related research and other professional writings on partnerships. While dominated by descriptive case studies, the partnership literature is expanding to include systematic research examining the dynamics of partnerships. A review of this literature is presented which first examines the resource areas and management functions addressed in this body of literature. Next, a summary of selected partnership research is presented. The paper concludes with a research agenda for future partnership research.

Resource Areas Addressed

Table 1 illustrates how pervasive partnerships have become in natural resource management. Clearly, partnerships are the means by which resource management agencies are responding to a host of non-traditional issues. From Native American policy to cultural resource management, agencies are developing and implementing policy through the use of partnerships. Partnerships have been used less often in managing timber resources on public lands.

Management Functions Addressed

Table 2 demonstrates how partnerships are being used by resource management agencies to accomplishing a number of management functions. One usually thinks of partnerships as a voluntary association of agencies and interests with a mutual interest in a common issue. However, it is interesting that, increasingly, partnerships are being mandated in federal legislation. For example, for a state to receive federal funds for a scenic byway project through the recent transportation bill (ISTEA), a strong local coalition must provide matching resources. Figure 2 illustrates how agencies are using partnerships to address both traditional and emerging management functions.

Table 1. Resource areas addressed in the partnership literature.

Community Recreation (McLean 1993)	Rural Recreation (Long, Keiselbach 1987)
Cultural Resource Management (Heid 1990)	State Parks (LaPage 1994)
Fisheries (Lunn, Begalka 1990)	Timber Management (Lunn, Begalka 1990)
Historic Development (Heid 1990)	Trail Management (Jacobi 1983)
Interpretive Programs (Hoecker 1990)	Tourism Development (Wallace et al 1990)
National Parks (Reinhardt 1993)	Urban Parks (Tindel, Overstreet 1990)
Native American Policy (U.S. Forest Service 1990)	Wilderness (Tippets 1992)
Range Management (Tippets, Anderson 1991)	Wildlife (Nelson, Raml 1989)
Research Natural Areas (Greene 1985)	

Table 2. Management functions addressed in the partnership literature.

Administration (Hansen 1989)	Fundraising (Decker 1991)
Communication (McAvoy, Schatz, Lime 1991)	Marketing (Zeiger, Caneday, Baker 1992)
Compliance with new regulations (Kunert 1992)	Planning (Gordon 1988)
Conflict Resolution (McAvoy, Schatz, Lime 1991)	Public Affairs (Crowley 1988)
Customer Service (Longan 1988)	Public Involvement (Heid 1990)
Developed Recreation (Long, Kieselbach 1987)	Research (Bishop 1991)
Ecosystem Management (Mott 1985)	Resource Protection (Vento 1985)
Education (Bishop 1991)	Special Uses (Brown 1986)

Summary of Research: Partnership Outcomes

Predictably, a number of articles have attempted to document the advantages or benefits of partnerships to the participating agencies and interests. Fewer studies have isolated the disadvantages or costs of partnerships to the respective interests. Hansen (1990) described several partnerships initiated between the USDA Forest Service, commercial outfitters, and other professionals in the Boundary Waters Canoe Area Wilderness. These partnerships involved contracted services for wilderness maintenance, public education, architectural planning, and law enforcement. In all cases, partnerships were touted as powerful management tools and providing significant cost savings to the

Forest Service. Other benefits cited included involving the maximum number of people in the "ownership" of the wilderness area and providing a better understanding of wilderness maintenance issues by all those parties involved. On the negative side, concerns were raised about the managers' ability to control the activity of the partners. Examples of these include verifying the performance of private contractors and substandard or even destructive work by well-meaning volunteers.

Kunert (1992) recently reported on his experience with partnerships on the Los Padres National Forest in California. A core group of Forest Service employees convened to form an Access Team (The 'A' Team) whose vision was to make the Los Padres National Forest accessible to all constituencies. With the battle cry, "how can we help you?, the 'A' Team has been the catalyst for initiating a number of partnerships that have designed and constructed accessible facilities. Summarizing the human payoffs of these partnerships, Kunert noted that understanding increases with participation and that partnerships create an expanding pool of resources, the most valuable of which is the partnership itself.

Assessing the Potential for Forming Partnerships

One line of partnership research has tried to assess the potential for forming partnerships. For example, Norman, Lime, and Roggenbuck (1990) conducted a survey of commercial river outfitters and National Park managers on three popular rafting rivers in the Eastern United States. The researchers had subjects rank the severity of different problems on the rivers and then rank potential solutions to those problems. The researchers concluded that, in many situations, partnerships were feasible because Park Service managers and commercial outfitters had similar views about the severity of problems and finding cooperative solutions. For example, both groups identified litter along riverbanks as a problem and agreed to sponsor an annual river clean-up day.

In another study, Jacobi and Wellman (1983) examined successful partnerships existing between hiking clubs and respective resource management agencies. The researchers explored managers perceptions regarding performance, administrative considerations, cost-effectiveness, communication, and political considerations. Based on results from extended personal interviews, the researchers concluded that considerable potential existed for expanding partnerships between resource management agencies and the nonprofit sector and that these partnerships could help provide quality recreation opportunities in a time of government retrenchment.

Characteristics of Successful Partnerships

Another stream of emerging research is examining those structural characteristics that typify successful partnerships. A study by Selin and Chavez (1994) is representative of this work. The researchers examined three recreation partnerships--a community project in Eagle, Colorado to construct a visitor information center, an interagency effort in Utah to develop a state scenic byway system, and a community project in St. Maries, Idaho focusing on interpreting the logging history of the area. Key informant interviews were conducted with all the primary players in each partnership. Participants in the study attributed the success of their partnership to many factors including personality traits, ability to compromise, support from administration, and the importance of having a written plan of action. Characteristics of partnership success were grouped into four categories: personality, interpersonal, organizational, and operational.

In another study, Darrow, Vaske, Donnelley, and Dingman (1994) conducted a content analysis of 25 partnerships initiated or supported by the National Park Service. Based on their analysis, the researchers concluded that successful partnerships were characterized by broad-based participation, a written plan of action, identified partner roles, and a plan for involving the public in partnership activities.

Constraints to Partnership Success

With all the euphoria over the benefits of partnerships, less attention has been given to the causes of partnership failure. Yet, research has shown that partnerships are fragile and need to be nurtured at each stage of development. A number of potential constraints have been identified in the partnership literature. Selin and Chavez (1992), in their study of three community partnerships, identified several organizational and operational factors that constrained partnership success at various stages. Organizational factors mentioned by respondents included restrictive personnel and financial accounting policies and revolving door hiring practices that led to a lack of continuity in partnership support staff. Operational constraints identified included lack of a binding cooperative agreement and a loss of momentum when partnership tasks were delegated to people not on the steering committee. There was also a tendency for partnership steering committees to rest on their laurels once initial goals were achieved.

Stages of Development

Finally, research has shown that partnerships are not rigid sets of relationships among organizational interests. Rather, they are dynamic and evolving. Further, partnerships naturally evolve through sequential stages that can be identified. Selin and Chavez (1992) describe a number of economic, social, and political factors that typically lead to partnership initiation. These factors include existing networks, crisis, leadership, incentives, mandate, and a common vision. Once initiated, partnerships were observed to evolve through a problem-setting, direction-setting, and structuring stage of development. The implication for managers is that partnerships may require different facilitative skills at each stage of development. For example, the managerial skills needed to convene a group of strong-willed interests is quite different from those skills needed to maintain partnership momentum once initial objectives have been achieved.

Research Agenda

While descriptive case studies and exploratory research has started to unravel some of the complexities of partnerships, more empirical research is needed to develop general principles and guidelines for initiating and sustaining effective partnerships. Many research questions remain untested. For example, why do some partnerships fail? And, why are partnerships so fragile? How do we measure or define success in partnerships? What are the social, economic, and political factors leading to partnership initiation? What social and organizational factors facilitate partnership continuance and expansion? Research is needed to develop a model of the life cycle of partnerships and to develop a typology of partnerships. Finally, it has been suggested that by involving the public in partnership activities, resource management agencies may be creating a new constituency that will support agency policies in the political arena. Research is needed to test this hypothesis. How do partner attitudes towards the agency change over the course of their partnership involvement?

Empirical research on partnerships has been dominated by descriptive case studies and analysis. Other research designs and levels of analysis are needed. Longitudinal research is needed to examine the life cycle of partnerships and how partner attitudes towards the agency change across the life of the partnership. Our understanding of the dynamics of partnerships would also benefit from a combination of qualitative and quantitative designs. Partnerships should be empirically examined at several levels of analysis including the individual, the organization, and the network. Finally, interested scholars should be careful not to reinvent the wheel. Researchers from a number of social service fields, notably in organizational sociology and organizational behavior, are empirically examining partnerships. This rich body of literature should be consulted before selecting research topics and designs.

Conclusions

The rising tide of interest expressed by managers and academics in partnerships is encouraging. LaPage (1994) provided a lofty vision at the Northeast Recreation Research conference. Partnerships have the potential to "reconnect" our natural resource management agencies to the larger community. Partnerships offer a positive alternative to closures, reduced hours, and minimal staffing as an agency response to downsizing. And, partnerships not only allow agencies to improve service on a smaller budget, but move the agency towards greater control of its destiny. However, partnerships are not a panacea. Managers must do more than give lip service to partnerships. They must create an organizational environment where employees are encouraged, rewarded, and provided the time available to engage in partnership activities. Social science research can help illuminate this managerial path.

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CHANGES IN FEDERAL AGENCIES PANEL:

HUMAN DIMENSIONS RESEARCH AND ECOSYSTEM MANAGEMENT: POLICY AND RESEARCH IMPLICATIONS FOR RECREATION RESEARCH EFFORTS

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With an increased emphasis being placed on ecosystem management, the importance of Human Dimension Research (HDR) efforts in management and policy formulation are becoming more important. Developing an understanding of the type of management questions and policy needs that can be addressed by human dimension research is becoming increasingly important and timely. This presentation describes some of the changes occurring in natural resource research efforts relative to human dimensions.

Introduction

In Lewis Carrol's The Adventures of Alice in Wonderland, Alice espies a strange-looking rabbit, follows it down a hole and ends up trying to get through a door that is much too small for her. In some ways we are faced with a similar analogy in natural resource management. We have been confronted with a creature called "heightened public awareness" in the management of our natural resources, and followed that creature along unfamiliar terrain (public involvement in decision-making) and have come to a door that is difficult for us to get through (actually integrating the social sciences into policy and decision-making).

At times it appears like the prime directive of natural resource agencies has shifted from "what can we do for the public" to "what can the public do to us?" From a national perspective, questions such as value (Brown, 1984; Bengston, 1993), the impact of attitudes on behavior (Vincent and Fazio, 1992), and the relationship between environment usage and the impact upon social structures (Force, Machlis, Zhang, and Kearney, 1993) are not always easy to ascertain from local-based public meetings and issues. Many of the problems society now faces in the management of its natural ecosystems transcend easy solutions because they are global in nature, represent a longevity of neglect, are cross-cutting in political boundaries and scientific disciplines, involve damage that, in some cases, is irreversible and will require long-term, expensive solutions. From an ecosystem perspective, reality suggests that while the goal of management may be to understand and maintain biodiversity at the genetic, species, and ecosystem levels the fact is that human populations are consuming the ecological capital of the world at ever increasing rates.

What is needed is a re-examination of how research involving the social sciences can be more effectively used to aid in the development of natural resource policy and ecosystem management. Accordingly, this paper will review some of the current issues surrounding science and ecosystem management, discuss some potential roles that the social sciences can play and propose some questions that Human Dimensions Research (HDR) can address that may aid natural resource management.

For this paper, Human Dimensions Research is defined as: "The scientific investigation of the physical, biological, sociological, psychological, cultural, and economic aspects of communities and individuals in relation to the use and appreciation of natural resources.

Current Issues

Botkin (1990) suggests that the various constituents in environmental policy-making play different roles. According to Botkin (1990), the most appropriate source of identifying what goals natural resource management should strive for are the citizens. On the other hand, experts can be used to identify what goals are possible and how these goals can be realized, given the characteristics of the specific natural systems. Government can best be used to ensure standards of knowledge and/or actions of the experts and in identifying and implementing the regulation of practices and policies that ultimately help realize the goals desired by the citizens.

Institutions and agencies of every kind have sometimes misconstrued this mandate by assuming that public involvement and awareness will automatically change public behavior and garner public support. However, it comes as no surprise to those in the social and human behavior sciences, that such reasoning often flies in the face of scientific findings and past history. In this case, science is unambiguous about the ambiguous nature of human behavior being shaped by a variety of internal and external factors (Brislin, et. al., 1986; Clark, 1992; Krahe, 1992)

Moreover, the demands being placed on science by management and policy-making needs are increasing and becoming more complex. Essentially, these demands include four general categories or demands: (1) prediction, (2) policy development, (3) impartial fact finding and (4) inventory and monitoring capabilities.

Given these conditions, what are some components that would constitute a successful Human Dimensions Research program? First and foremost, scientific credibility is of utmost importance. Without it, findings from Human Dimensions Research efforts will be regarded as based on opinion and "common sense" or in a worst case scenario, not even be considered in the policy and decision-making arena.

Other considerations include examining systems instead of focusing solely on the components of those systems, anticipating future events and issues that generate needs for research, developing research that is policy-relevant but not necessarily policy-driven and develop research efforts that are consistent and responsive to broad-based mandates such as those from Congress or scientific academies. In addition, because of the growing complexity and interconnectedness of many of the natural resource issues facing society, successful research programs will increasingly entail efforts that are multi-disciplinary and multi-scale as well as providing aids to decision-making in an adaptive management setting.

Barriers to Human Dimensions Research

There exist, however, a number of potential barriers that can potentially interfere with the development of successful research programs in Human Dimensions Research. At the national level, there is a lack of effective leadership and coordination. Great ambiguity exists concerning what Human Dimensions Research is and what it can contribute to policy development and decision making. Other barriers include the persistent belief that Human Dimensions Research and the social sciences, in general, are less important than the biological and physical sciences. When considering questions that have a social science application, there exists a preponderance of economic viewpoints and methodology. The broad range of other social sciences such as anthropology, social psychology, and political science are often not considered as useful in generating valuable information. Finally, funding levels have not been responsive to the growing

importance of human dimensions with much more funding being allocated to the physical and biological sciences instead of the social sciences. This is true, even though the questions being studied are often human-centered.

Failure to Implement
Failing to implement a comprehensive program in Human Dimensions Research will degrade the capability of the land management agencies and associated institutions from implementing a broad range of effective management strategies. Several of these impacts are listed in Table 1.

Table 1. Impacts from not having a human dimensions research program.

- Lack of understanding public preferences, motivations, and desires
- Decreasing ability to communicate with public
- Reduced understanding of human/natural environment interactions
- Reduced ability to anticipate and plan for future changes
- Loss of full capability to develop strategies for environmental stewardship
- Decreased effectiveness of multi-dimensional programs (e.g., T&E species)

As can be seen from Table 1, the results of not instituting a Human Dimensions Program involve a wide variety of negative outcomes. There already exists a number of natural resource problems that have demonstrated a lack of attention paid to the human dimension. These issues include the Spotted Owl, anadronmous fish, and public mistrust of government's willingness to safeguard the natural resource base.

Policy and Management Issues

Given these concerns what are some of the research issues that are related to human dimensions needs of specific policies and management decisions. A sample of these issues are listed in Table 2.

Table 2. Potential human dimensions research issues.

- What is the nature of resource conflict?
- How do people "perceive" and "value" natural resources?
- What societal changes will impact resource management and how will these impacts be manifested?
- What are the driving forces behind biodiversity loss and ecosystem destruction?
- What are the costs and benefits of resource development from a multi-attribute standpoint?
- How can human behavior be modified to mitigate impacts?
- What are the effects of environmental degradation on human health and well-being?
- How can distributive justice and procedural fairness be instituted?

Bormann (1993) posits that concepts of the environment such as sustainability, forest health, biodiversity, and ecosystem management are essentially human constructs that serve as expressions of human values. Clark and Stankey (1994) suggest that agencies and institutions are poorly equipped to develop a thorough understanding of human dimensions issues. Machlis (1992) makes the observation that biologists, ecologists, and other natural science professionals are now faced with a hard reality: ultimate solutions to natural resource problems lie in social, cultural, economic and political systems; the very systems that are the focus of the social sciences. Holden (1988) has argued that:

> *The social sciences have lagged far behind in assessing the interactions between physical changes and human activities. Far more is known about the processes of global warming, deforestation, resource depletion, and pollution than about the processes of the human institutions that create these effects.*

What is needed is a re-examination of the role the social sciences and Human Dimensions Research should assume in current and future natural resource management issues. How successful the natural resource community is at integrating the social sciences through a Human Dimensions Research program will determine, in large part, how effective any emerging long-term solutions to these various resource issues will be. Failing to include people into the natural resource equation spells problems for both society and the social science disciplines.

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Poster Sessions



TRAVEL AND TOURISM TRENDS

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Demographic trends which impact leisure time activities are highlighted, with particular emphasis given to the impacts of the growth of minority populations. Data was collected from recreationists to National Forests and from residents of an urban community. The data indicate a shift in outdoor recreation activities.

Introduction

Demographic trends evidenced today can give us insight into what might be expected in the years to come. These trends are important in and of themselves and also because of their affect on other issues, such as their impact on leisure activities. Trends briefly examined in this paper and linked to leisure patterns include the graying of America, MOBYs (Mothers Older when Baby is Young), the sandwich generation (those who care for their parents when also caring for their own children), and the middle-age economy (characterized by cautious consumer spending and more saving). Most emphasis is given to the potential impacts of the growth of the minority population for outdoor leisure activities, particularly the growing Hispanic population.

Leisure activities linked to the growth of the minority population focus on outdoor pursuits and emphasize adventure travel (hang gliding, bungee jumping, and heli-skiing), conservation travel ("green" vacationing and volunteer hosting), traditional natural resource activity participation (horseback touring, off-road vehicle riding, and natural history hiking), and non-traditional natural resource activity participation (camera safaris and mountain bike riding).

It is expected that changes in demographic patterns will influence leisure pursuits. It is not known how the combination of the demographic shifts will impact leisure pursuits.

Socio-demographic Trends

Current trends may afford insight into what can be expected in years to come. Each trend will be briefly introduced as well as linked to their potential impact to leisure activities--particularly outdoor recreation activities.

The graying of America, as the name suggests, indicates that people are living longer. Indeed, this is one of the fastest growing age cohorts. The graying of America may influence participation in leisure activities in several ways. First, this group generally has good financial assets and leisure businesses could benefit from this affluence. Second, senior citizens have been thought to be somewhat more sedentary than their younger counterparts which might suggest that leisure givers need to provide more activities geared to sedentary populations--such as walking tours with educational emphases. Recreation providers might also concentrate on highly developed recreation sites for this age group.

MOBYs is a relatively new term which suggests that many women are waiting later in life to start families. These mothers may have better financial standing than do younger mothers, thus allowing older moms to provide for more recreational activities for their offspring. This may include more purchases of recreational equipment for the home and for outdoor activities. Because many of these MOBYs are employed outside the home, they may be looking for more leisure activities nearby or activities which require little planning.

The sandwich generation is another trend on the rise. In some cases the combining of families provides more expendable income, while in other cases it means greater caretaking placed on the "sandwich" members. In all cases it suggests a need to focus on leisure activities that would appeal to the entire age span and may suggest a need for developed sites for recreational activities.

The middle-age economy is characterized by cautious spending and increased saving. This suggests that baby boomers are changing their spending patterns which will influence recreational patterns. It could mean that boomers may concentrate their money into one area and not others. One area experiencing growth is the recreational vehicle business. This represents one large expenditure for a family, but one that has utility for a long time. Outdoor recreation sites, like campgrounds, may want to increase spaces for these large vehicles. Those recreation providers wanting to attract middle-age economy members may want to emphasize their low-cost or free activities.

The growth of the minority population is another demographic trend worthy of note. It is expected that during the 1990s we will shift from a society dominated by Anglos and rooted in Western culture to a world society characterized by three large racial and ethnic minorities--African American, Latino or Hispanic American (hereafter called Hispanic), and Asian Americans. Trends focusing on Hispanic groups suggest younger, larger families, an expanding middle class, and increasing educational attainment levels. Recreational or leisure facilities may need to accommodate larger groups, focus on family activities, focus on the entire age span, and offer a range of recreational costs.

The remainder of the paper examines outdoor recreation activities for actual participation levels as well as desired participation levels. Then the paper focuses specifically on comparing Anglo patterns of participation (real and desired) to Hispanic patterns of participation (real and desired).

Methods

Data were collected from 200 visitors to National Forests in 1992 will be used to highlight points made by the paper. Other data, collected from 130 urban city residents in 1992 will also be used to illustrate points made in the paper. Both sets of data show current and desired patterns of participation. On-site data were collected using self-administered questionnaires while the urban city data was collected via telephone surveys. Both survey types were available in English and Spanish. Just over half the sample were people of Hispanic descent (54 percent) and the remainder were Anglo (45 percent) respondents.

Respondents were asked if they had heard of, engaged in, and/or desired to engage in several outdoor recreation activities. These activities included hang gliding, bungee jumping, heli-skiing, "green" vacationing, volunteer hosting, horseback touring, off-road vehicle riding, natural history hiking, camera safaris and mountain bike riding.

Results

In general, most respondents had not tried any of the activities listed--indeed, few had heard of many of the activities--yet most respondents reported a desire to try these activities in the future. For example, few had heard of or tried wildlife viewing or camera safaris though most (75 percent) expressed an interest in trying it in the future. Other examples were ecotourism and volunteer hosting, where few had heard of them before though most reported they would like to try them. The exceptions were heli-skiing and bungee jumping where few people had heard of these, tried or desired to try these activities in the future.

Ethnic and Racial Group Analysis

For this paper, the comparison will be of people of Hispanic origin to Anglos.

While Anglos were more likely to have tried natural history hikes and Hispanics expressed a greater interest in horseback tours,

there were no other statistically significant differences between Anglo and Hispanic groups. However, some interesting patterns did emerge.

Matrix One, below, shows actual levels of participation in the outdoor recreation activities. If more than 30 percent of the sample had engaged in the activity then it was considered to be a "traditional" activity for that group. For example, more than 30 percent of the Anglos in the sample engaged in natural history hikes, horseback tours, and mountain biking so those activities were considered traditional for that group. For the Hispanics, more than 30 percent had engaged in mountain biking and natural history hikes. Thus, Anglos have three traditional activities from the list provided while Hispanics have two traditional activities.

Matrix One. Actual participation by racial/ethnic groups.

	Anglo	Hispanic
Traditional (30%+)	Natural history hikes Horseback tours Mountain biking	Mountain biking Natural history hikes
Non-traditional	Ecotourism Camera safaris Hang gliding Volunteer hosting Heli-skiing Bungee jumping	Horseback tours Ecotourism Volunteer hosting Camera safaris Hang gliding Heli-skiing Bungee jumping

Matrix Two shows desired levels of participation in the outdoor recreation activities. If more than 30 percent of the sample desired to engage in the activity then it was considered to be potentially a "traditional" activity for that group. For example, more than 30 percent of the Anglos in the sample desired to engage in natural history hikes, horseback tours, mountain biking, and hang gliding--so those activities have the potential to become traditional for that group. For the Hispanics, more than 30 percent desired to engage in mountain biking, natural history hikes, horseback tours, camera safaris, and volunteer hosting--so those activities have the potential to become traditional for that group. Thus, Anglos might have four traditional activities from the list provided while Hispanics might have five traditional activities.

Matrix Two. Desired participation by racial/ethnic group.

	Anglo	Hispanic
Traditional (30%+)	Natural history hikes Horseback tours Mountain biking Hang gliding	Horseback tours Natural history hikes Mountain biking Camera safaris Volunteer hosting
Non-traditional	Camera safaris Ecotourism Bungee jumping Volunteer hosting Heli-skiing	Ecotourism Hang gliding Heli-skiing Bungee jumping

For the most part, there is a consistency between activities in which Anglos participate and those they wish to try. However, for each activity listed there is at least a 20 percent gap for Hispanics between having tried an activity and desire to try it. This suggests a potential market demand that is not currently being served.

Conclusions

Demographic trends can give us insight into what might be expected in the years to come. While several trends were listed, only growth of the minority population was addressed. This one demographic shift suggests changes in what might consider "traditional" activities. From the matrices above we can see the shift in desired activities of Hispanics in terms of more activities (both traditional and non-traditional) as well as adding a conservation travel aspect. While other societal factors may preclude Hispanics from participating to their desired level, it is important to see what might be desired from this user group. The examination of combinations of demographic trends will give us greater insight into potential impacts on leisure pursuits.

A CASE STUDY OF THE IMPACTS OF "ALL INCLUSIVE PRICING" ON RESORT RECREATION PARTICIPATION

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This is an investigation of the impacts on recreation participation observed at a large upstate New York resort as it converted to "all inclusive pricing." Findings indicate that both recreation participation and recreation revenue increased significantly after the implementation of the new pricing policy.

Introduction

This is an investigation of the impacts on recreation participation observed at a large upstate New York resort as it moved from traditional "a la carte" pricing for recreation services to "all inclusive pricing" that included recreation activities as well as meals and other services in the basic room rates of the resort.

Traditional resort pricing structures are based on the "European Plan" that uses individual pricing for each portion of a resort visit such as rooms, food and beverage, and recreation services or the "American Plan" that includes meals only in the daily room rate. In either case, recreation activities are not included in the resort room rates. Recently, this trend began changing. The primary reason for this was pressure put on the resort industry by the growing cruise line industry. Current economic conditions force many travelers to focus on the "bottom line" of their vacation destination as a way to improve the value they receive for their vacation dollar. As a result, resorts have seen many guests choose cruise vacations as well as request greater packaging and "cruise line pricing" at destinations they visit.

For years, cruise ships included all their fees, with the exception of alcohol, in their basic rate. This allowed the potential cruise guest to evaluate the total cost of the cruise vacation before they made their travel decision. This was not easy for potential resort guests with traditional resort pricing policies because of the a la carte nature of the purchasing decisions.

In response to this growing trend, a large New York resort implemented "all inclusive pricing" in March 1993. Rather than just "give away" the facilities and activities at the regular room rate, the resort increased room rates and set aside a portion of the increased room revenue for resort recreation usage. Since the resort continually collects data on occupancy and recreation usage, the opportunity existed to compare user data from both before and after the implementation of "all inclusive pricing" to compare its effectiveness.

Method

Data analyzed in this study represents recreation usage and occupancy information collected from early April until early November during the years 1992 and 1993. The recreation department's daily reports provided raw user data for youth programs, tennis court usage and boat usage. The Hotel Operations Director at the resort provided daily occupancy counts.

The resort collects data using 13 four week periods rather than using 12 months of unequal days. Each weekly period starts on Monday and ends on the following Sunday. This allows the resort to compare usage by weekly period and day of the week. To compare user data in a similar manner an adjustment was made. Rather than comparing April 1, 1992, to April 1, 1993, (the days of the week would be different) each day of the season was entered as "day 1, day 2, all the way to day 217" with the 1992 data beginning on Wednesday, April 1 and the comparable 1993 data began on the closest Wednesday which is March 31. Thus weekends compare to weekends and weekdays compare to weekdays. This is important because the analysis required repeated measures testing.

The resort also grouped data into the following seasons:

Spring	-	April 1 through the Friday prior to Memorial Day Weekend. (52 days)
Early Summer	-	Memorial Weekend through the Friday prior to the July 4th weekend. (41 days)
Summer	-	July 4th Weekend through Labor Day. (67 days)
Fall	-	Tuesday after Labor Day through the close of the season. (57 days)

Additionally, the 1993 user data was collected in the form of actual user counts while the 1992 data was collected in the form of daily income reported. To convert the 1992 data to user counts, the income amount was divided by the appropriate fee amount (Youth Programs - $6.33, Boats - $3.74, and Tennis courts - $10.00). The prices charged in 1992 were used to allocate revenue in 1993. Thus, increases in recreation participation caused proportional increases in recreation revenue.

Results

Initially, a series of paired t-tests was run comparing 1992 and 1993 recreation usage. The tests indicated that in every activity the 1993 usage was significantly greater than the 1992 usage (Table 1).

Youth activities increased 47.7 %, while tennis grew 73.8%, and boating changed 58.7%. Overall, the average daily participation between 1992 and 1993 grew 58.5%.

Table 1: A comparison of recreation participation rates between 1992 and 1993.

Average daily participation	1992	1993	'93/'92 Change	Paired t value	Probability
Youth Programs	14.46	21.65	147.7%	4.63	.001
Tennis	7.69	13.37	173.8%	6.64	.001
Boating	47.51	75.38	158.7%	5.61	.001
Totals:	69.66	110.40	158.5%	6.53	.001

An additional paired t-test compared occupancy figures to test if a change in occupancy might have influenced usage.

There was a 3.8% increase in occupancy between 1992 and 1993 (Table 2). Though good for business, it is considered statistically non-significant. This lends support to the hypothesis that increases in recreation participation would be due to the change in pricing.

To test if change in recreation usage varied more strongly as the seasons varied, a series of ANOVA tests was run comparing the daily percentage change for 1992 to 1993 for each activity and the total of all the activities.

Though recreation usage increased in every activity during every season, there were no significant differences in the rate of increase seen by each activity by season (Table 3).

Table 2: A comparison of 1992 and 1993 occupancy rates.

	1992	1993	% change	Paired t value	Probability
Average Daily Occupancy	298.95	310.46	3.8%	1.09	.2765

Table 3: Occupancy and recreation usage comparisons by season.

	#	Occupancy		Youth Programs		Tennis		Boating		Total Use	
	Days	1992	1993	1992	1993	1992	1993	1992	1993	1992	1993
Spring	52	173	162	6.9	9.5	1.0	3.2	23.9	26.8	31.8	39.5
Change '93/'93			*94%*		*138%*		*320%*		*112%*		*124%*
Early Summer	41	289	297	12.2	14.5	7.0	13.0	50.7	88.5	69.9	116.0
Change '93/'93			*103%*		*119%*		*186%*		*175%*		*166%*
Summer	67	401	444	28.5	47.9	14.8	26.0	74.8	124.9	118.1	198.8
Change '93/'93			*111%*		*168%*		*176%*		*167%*		*168%*
Fall	57	308	304	6.9	7.8	6.1	8.3	35.9	53.2	48.9	69.3
Change '93/'93			*99%*		*113%*		*136%*		*148%*		*142%*

Conclusions

Indications are that resort activity usage nearly doubled in youth activities, tennis and boating when the new pricing policy went into effect. The results of this case study indicate that "all inclusive pricing" may permit resort operations to increase recreation usage of resort facilities while increasing guest perception of value.

The increases in usage took place regardless of season. Apparently the "all inclusive pricing" policy is perceived to be a value regardless of season.

It should be noted that the revenue allocated to the recreation operation in 1993 was based on the same prices charged in 1992, thus increases in usage proportionally increased recreation revenue. "All inclusive pricing" may provide a mechanism that increases recreation usage and recreation revenue while at the same time increasing efficiency by requiring fewer cash control points with their attendant costs.

From the research standpoint, this case study illustrates the impact that pricing has on the effectiveness and efficiency of recreation operations. "All inclusive pricing" provides the opportunity to optimize recreation usage without increasing investments in facility development, program expansion or advertising. Additional studies are warranted to test whether "all inclusive pricing" is beneficial at other operations.

STEPS IN THE OPEN SPACE PLANNING PROCESS

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This paper presents the steps involved in developing an open space plan. The steps are generic in that the methods may be applied to various size communities. The intent is to provide a framework to develop an open space plan that meets Massachusetts requirements for funding of open space acquisition.

Introduction

Open space is being depleted across the state of Massachusetts at an alarming rate. Although Massachusetts is only recently showing signs of economic recovery after several years of recession, many communities have seen major increases in the areas of residential, and commercial and industrial development. In many communities the number of new subdivisions has dramatically escalated over the past decade. For example, Pembroke, a small community midway between Boston and Cape Cod, showed an increase of ten percent in the total housing stock over the past seven years.

Along with housing projects, many communities have also seen a dramatic rise in commercial and industrial development. Due to the economic conditions, many communities have supported incentives for industrial development in order to improve the tax base of fiscally constrained budgets. In Northampton, a mid-size city in western Massachusetts, an industrial park was proposed ten years ago to entice light and heavy industrial development in a specified district of the city. In Worcester, a large city in central Massachusetts, a "medical city" is planned. Projects will include major hospital and ancillary medical facilities, as well as biotech plants and supporting services. Communities continue to offer financial and political support to commercial and industrial developers, particularly for clustered, specialty development.

Farmland has also been depleted in areas of central and western Massachusetts. Over one hundred and sixty thousand acres of Massachusetts farmland are tended by dairy farmers. Out of eight hundred dairy farms in the state, over fifty percent have been lost in the past ten years. The main reason for this is that Massachusetts dairy farmers are receiving the same price for their milk that they did in 1978.

Farmers have recently been voicing their concerns that they can no longer afford to farm at 1978 income levels and pay for costs that have risen steadily for the past thirteen years. For these reasons, many farmers have been forced to apply for dairy and livestock buy-out programs, initially introduced by President Bush in the early 1990s. As more and more farmers decide to sell, communities should be aware that they are losing revenue, as well as aesthetic value, when each farm is sold. In fact the dairy industry contributes nearly three hundred million dollars to the Massachusetts economy annually.

In the urban areas of the state the main problem of loss of open space occurs in recreational areas. Funding has been cut back for organized sports, as well as passive recreational areas. The Metropolitan District Commission (MDC) in Boston closed down the public pools in the city in 1991 due to severe budget problems. As inner city problems intensify, the need to preserve open space for recreational use becomes more acute.

The point is open space will continue to be depleted for housing, and commercial and industrial projects. In order to manage the growth, and still provide for recreation and open space preservation, an open space plan should be developed. The open space plan should be written as a guide for the community to follow. The plan should clearly state the parcels that should be preserved, and the parcels that should be developed for recreational use. An open space plan provides land use techniques to balance growth and conservation in a community.

Before the planning process begins, planners should determine the available allocations of funding for the various land use programs at the federal and state levels. Criteria and standards for the open space programs should be matched to the characteristics of the particular community. For example, if a community has farmers interested in applying for reduced tax abatement under a farmland program, the planner should determine the amount of funding available for farmland preservation in the state. In Massachusetts, the governor recently approved an increase in the Agricultural Preservation Restriction Program (APR) funding. Land trusts and land banking programs have also become widespread across the state. For these reasons it is appropriate to conduct a farmland inventory to determine the farms that should be recommended for the APR program. The farms should be prioritized in terms of which ones are most susceptible to development pressures.

Other land use grants that could potentially provide funding for open space planning are Community Development Block Grants (CDBG) and Urban Development Action Grants (UDAG). The availability of funding for these grants should especially be investigated if recreational activities can be linked to community development programs.

The following open space planning process steps include methodological techniques that can be applied in the specified community. The steps should be considered sequentially. However, not all the steps need necessarily be applied in each community. For example, a mid to large urban community may not need a farmland inventory. Conversely, a rural community with a small population base may not need additional recreational facilities.

The planning steps should be applied individually for each community. In this way, the planning model can be tailored to meet the needs of each community. It is also important that open space plans be revised every few years in order to take into account any changes that have occurred in the community or the region. Demographic changes showing an influx of retirees, such as Cape Cod is now experiencing, would indicate a change in services for the area. In another case, if a regional sports complex is proposed for a community, the surrounding communities should consider the impacts of the complex on their recreational needs. An illustration of this regional planning problem is occurring now in Worcester, Massachusetts. The state is considering building a major sports complex in Worcester. If the sports arena is constructed, surrounding communities will have to rethink their recreational needs. In some cases it is cost- effective to pay user fees to the nearby town, rather than building a similar complex and duplicating facilities.

STEP 1: Prepare a Community Profile

The profile of the community should include a physical geographic description, including an inventory of the topographic features, and watershed and aquifer areas. The profile should also include a socio-economic study of demographic statistics. The current demographic statistics should be classified into age and gender groupings in order to determine existing and potential needs for the town or city. Income levels and amount of affordable housing should also be collected. From these data projections can be made to determine capital facility needs for the community.

A regional perspective of the surrounding area should be included in the profile. This helps to create a complete picture of the community in terms of duplicating and sharing facilities. A capital facilities study should also be included. This study should list existing and future facilities including schools, libraries, and cultural centers. Monies allocated for future projects should be discussed.

STEP II: Generate A Land Use Inventory

A land use inventory of conservation and recreation parcels should be compiled. An existent land use inventory map should be generated. The land use data should include; ownership, current use, condition, recreation potential, public access, zoning, and degree of protection for each parcel. Any public or private grants that have been awarded to the community should be listed. The most effective way to present this information is by map and matrix with accompanying narrative. These narratives should include "degrees of protection" for each parcel, deed restrictions, updated listings of lands under chapter 61, 61A & 61B and watershed protection parcels.

The required maps for the open space planning process for Massachusetts include privately and publicly mapped parcels. Privately mapped parcels include agricultural lands(61A), forest lands less-than-fee-interest, private recreation lands(61B), estates, farms not under 61A, major institutional holdings and land for available reuse.

The public and non-profit parcels that must be mapped include public conservation and recreational resources, semi-public lands, other public lands and state or federal institutions.

STEP III: Environmental Analysis

The purpose of this section is to provide a description of the environmental and cultural makeup of the region. It is at this stage that preliminary goals and objectives about environmental impacts should be formulated. This is necessary to make different boards aware of any adverse effects development would have on the environmental attributes of the community. By mapping the environmentally sensitive and fragile areas of the community, it will be easier to identify them when making land use decisions.

The environmental analysis section should be divided into the following categories; geology, soils, topography, landscape character, water resources, vegetation, fisheries and wildlife, scenic resources, unique environments and environmental problems. A brief description of the geographical and environmental attributes in each category should be provided. These descriptions are necessary in order to identify any adverse negative environmental impacts that may occur with the development of expanded recreational facilities.

STEP IV: Community Goals

The write up of community goals portrays an outline of what the citizens of the community value. These opinions should be used to guide and direct the articulation of the community's overall plan. These factors should also take into account the previous examination of trends and resources. This process can be completed by using surveys, questionnaires or public meetings to allow the community to voice its opinion.

When stating the goals it should be done in very general terms. It could be described as; "What the community should be and what the community should look like." The community's "ideal open space system" should also be included. This ideal model meets the variety of needs that were expressed in the community's surveys, inferred from facility use, or implied by local policies and any other existing resources protection plan.

STEP V: Prepare an Analysis of Need

At this stage all of the previously acquired material should now be reviewed and analyzed to present any impacts that might result from the proposed development. This section should be a systematic explanation of what is needed to achieve the community's stated goals. The data is collected and synthesized in order to identify potential problems. The findings of this study will indicate the possible solutions to the problems. Any solution that the community has proposed should also be included in the findings.

The analysis of needs section should also include a summary of resource protection needs. The statement must be backed up with data from environmental inventory of public and private lands of conservation and recreation interests. Gaps in existing trails, greenways and linkages to major resources in adjacent communities should be noted. Data on recreation and conservation needs from the Community Setting section should also be noted.

STEP VI: Develop Goals and Objectives

This step involves expanding on the Analysis of Need section and the Statement of Community Goals to create a comprehensive set of goals and objectives. In this stage describe the present goals and objectives and include any previously stated ideas.

It is important to distinguish between what are considered general concepts and ideas, with actions for accomplishing intended goals. Throughout this part of the planning process, the planner must be aware that goals and objectives may be altered several times due to changing needs.

STEP VII: Draft a Five-Year Action Plan

A yearly timetable for specific actions to accomplish the objectives listed previously should be established. This process clearly identifies the priorities of the plan, and provides background to support the plan. This is important for public hearings and town meetings when citizens question the feasibility and effectiveness of the plan.

The five year action plan should avoid long lists of actions presented in a random order. If the goals are presented in a specific order, it helps assure that those with top priority will be addressed. There should be flexibility provided within the time table of when the actions occur. This is important because, for example, a property may be put on the market earlier than anticipated.

Each year the Open Space Plan Advisory Committee should evaluate implementation of the previous year's actions and revise the Action Plan accordingly. This will make the formal five-year update a more workable task.

STEP VIII: Solicit Public Comments

A letter of approval is required only from the Division of Conservation Services. The Open Space Plan itself must be distributed to several different boards and officials. This includes chief elected officials, boards of planning, health, appeals, recreation, and conservation commission. A dated distribution list and any comments received from the plan must also be submitted.

Required Maps

The following five maps are required in order to meet the Massachusetts requirements for funding. Each map should include the indicated attributes if applicable to your locality.

- The Special Landscape Features map should display scenic, cultural, historical and architectural resources, geological features, chapter 61, 61A and 61B parcels and soils.
- The Open Space Map should present public conservation, recreational resources, semi-public and APR lands.
- The contents of the Water Resource map should include the location of any aquifers, surface water, watershed or water supply areas and wetlands.
- The Zoning map should indicate zoning of all the parcels in the town.
- The Five-Year action map should illustrate the effects that the successful completion of any projected development or conservation restriction would have on the town.

References

All reference documents and experts consulted in preparing the community's Open Space and Recreation Plan should be cited. There are many planning agencies; such as regional planning agencies, local planning boards and commissions, that are helpful in gathering information for the Open Space Plan. Interviews with planning boards, select boards, planning commissions and citizens should be conducted. The Open Space Planner's Workbook lists resources to contact. These include local land trusts, Offices of Environmental Affairs, Department of Environmental Protection, Historical Commissions and different sources for technical and planning assistance.

Other data sources include tiger files, census data and SPSS (Statistical Package for Social Sciences) on computer software. Town reports, previous open space plans and master plans should also be reviewed. Assessor's maps, land use maps, soil conservation service maps, and G.I.S. maps for the community should be reviewed. Surveys and questionnaires concerning the community should be updated and analyzed.

Conclusions

In conclusion, the need for open space plans is becoming more critical. As the third most dense state, Massachusetts is continuously facing the depletion of open space. The open space plan is effective in protecting remaining open space. It is also a useful tool in long range planning to maintain and improve the character and aesthetics of the community. Since open space parcels include conservation, recreation, agricultural, park, buffer and conservation areas, the process sets future land use patterns and trends. The open space plan sets a framework for overall sound planning for the community.

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NATURAL RESOURCE MANAGERS: THEIR ROLE IN INTERNATIONAL TOURISM AND RURAL DEVELOPMENT

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Though our wildlands are important destinations for international visitors, little is know about their activities or influence on local economies. This paper encourages resource managers to assume leadership for developing an international tourism strategy for our wildlands by packaging lesser known wildland attractions as regional complexes to attract tourists.

Introduction

The United States had a merchandise trade deficit (imports of televisions, cars, etc.) of $101 billion in 1990 (Eckhouse 1991). This is not surprising, because the deficit has persisted since 1975. Nevertheless, a surplus in service trade exports has persisted since 1969, tripled since 1986, and amounted to $31.7 billion in 1990 (Eckhouse 1991). Furthermore, this amount is considered conservative by 50 percent, because many services, such as fees for technical advice or computer software, are difficult to track.

A service export has been defined as the transfer of foreign funds to the United States for a service rendered (Eckhouse 1991). Thus, a foreign tourist purchasing a ticket on a U.S. airline, or a foreign ship paying a docking fee at a U.S. port are examples of service exports. The ticket price or the docking fee represents foreign currency coming into the United States. Trade imports are just the opposite--a transfer of U.S. dollars to other countries for their products and services. When trade imports exceed exports, a trade deficit occurs, but a trade surplus accrues when exports exceed imports.

What do service trade exports have to do with the management of natural resources? Tourism is the largest category of U.S. service exports. Foreign tourism and travel on U.S. carriers accounted for nearly $53 billion in 1990, and the surplus attributed to tourism amounted to nearly $2 billion--the first tourism surplus ever (Eckhouse 1991). The service export surplus contributed to a reduction in the total trade deficit.

Over 50 percent of the 40 million foreign arrivals in the United States in 1990 were on vacation, and another 30 percent combined vacation with business (O'Leary 1991). Many foreign visitors are attracted by the likes of the Golden Gate Bridge, Disneyland, Las Vegas, and Washington D.C.(Eckhouse 1991), and much of their expenditures result from such visits. In addition, National Parks, National Forests, and other wildlands are important destinations for international visitors (Uysal and others 1990). Very little is known, however, about foreign use of wildlands and their importance has been generally overlooked (Andereck and others 1988; O'Leary 1989; Uysal and others 1990).

Visitor logs and field observations suggest that use of wildland recreation areas by foreign visitors is substantial (Simcox and Pfister 1990; Machlis and Wenderoth 1984). Therefore, it is reasonable to expect National Parks, National Forests, and similar areas to contribute to the service export surplus associated with tourism, and to the reduction of our overall trade deficit. The contributions could be greater if resource agencies were to encourage international visitation to our wildland areas.

This paper describes how wildland areas can be packaged for international tourists as a benefit to local communities and our national economy, and it offers an example from a wildland area in California. In addition, it directs resource managers to take the initiative for bolstering community endeavors to increase international tourism.

Increase International Tourism

The USDA Forest Service and, possibly, other resource agencies have a policy for "working with rural people and communities on developing natural resource-based opportunities and enterprises that contribute to the economic and social vitality of rural communities" (USDA Forest Service 1990, p. 5). Increasing tourism, especially international tourism, in rural America fits the policy. Because all tourists spend money for lodging, food, transportation, guided tours, entry fees, and souvenirs, tourism contributes to local economies and may surpass traditional industries in its contribution. For example, agriculture is the leading industry in Riverside County, California, but tourism is the fastest growing industry -- contributing three times as much money as agriculture in the Coachella Valley (Scally 1991). If tourism can bolster the economy of this agricultural community that is surrounded by desert, think what it could do for rural communities adjacent to attractive natural resource areas--particularly communities with a slow rate of growth and high unemployment.

The Canadian Park Service, Tourism Canada, and Statistics Canada have worked to obtain information about international travel, but U.S. natural resource agencies have made little if any effort to explore foreign markets (O'Leary 1991). Our "marketing" is aimed at domestic tourist dollars. While attracting U.S. tourists brings new money to rural communities, it fails to bring new money to the country or to help fight the trade deficit.

Resource agencies should join forces with organizations concerned with tourism and market lesser known areas (O'Leary 1989). Obviously, National Parks, such as Grand Canyon and Yellowstone; Lake Tahoe, on the border of California and Nevada; and ski areas like those at Aspen, Colorado, are well known to international visitors. Many other high quality, but "lesser known" areas, however, are capable of attracting foreign tourists, provided they are marketed effectively. From a Forest Service or Bureau of Land Management perspective, lesser known areas may mean nearly all of the lands they manage.

A majority of international visitors regard our National Parks and National Forests as the "key advantage" the United States has in the tourism market (O'Leary 1989). Therefore, why have not natural resource managers developed an international perspective about recreation and tourism? Resource agencies are not known for their innovation, have little visitor management, and have employees who would "like to see visitors stay home" (O'Leary 1991). These conditions reflect known attitudes and behavior of resource professionals that should be changed (Magill 1988), particularly if marketing of foreign visitors is to succeed.

Clustering Resources for Foreign Tourists

Taken individually, many natural resources and related cultural and historical attractions have relatively common appeal, that is, they may attract local people, possibly a regional clientele, and even some visitors from across the nation. The numbers of visitors can be expected to decline, however, with increasing distance from the attraction; and the number of international visitors is likely to be small to nonexistent. As a specific example, the Ancient Bristlecone Pine Forest, located in the White Mountains on the Inyo National Forest at the eastern edge of California, is accessible by motor vehicle over a route designated as a National Forest Scenic Byway. The forest contains specimens of the earth's oldest living trees growing above 10,000 feet of elevation. The area has spectacular views of the eastern escarpment of the Sierra Nevada and the Owens River Valley 6,000 feet below -- a photographer's dream! It also holds wonders for those interested in ecology, geology, and wildlife. Nevertheless, it is remote, and visitation is low. In fact, foreign

visits to the Inyo National Forest are nearly nonexistent (0.2 pct) with the majority of tourists coming from California (Lee and Brown 1991). The frequency of foreign visits may be a little larger, because people staying at motels and resorts were not counted.

The ability of the Ancient Bristlecone Pine Forest to draw from a greater pool of tourists, including international tourists, may be enhanced by grouping or "clustering" it with other local attractions on the Inyo and Toiyabe National Forests and surrounding areas (Figure 1). Such a regional complex would offer a comprehensive vacation experience competitive with other tourist attractions (Murphy and Keller 1990, Wall 1989). The "Inyo Complex" may be attractive to international tourists through effective marketing.

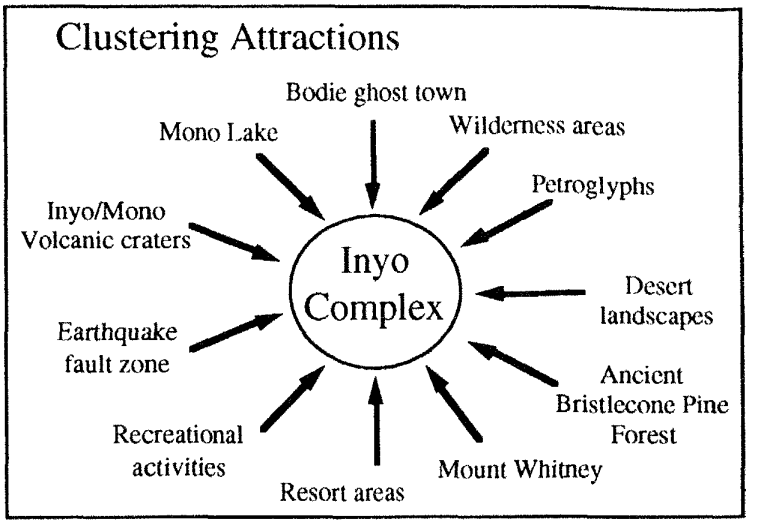


Figure 1. The Inyo Complex. Individually, many wildland attractions have relatively common appeal, but their attractiveness can be significantly enhanced by clustering them to offer a comprehensive vacation experience.

A tour of the Inyo Complex might start from airports at Reno or Las Vegas, in Nevada, or Ontario, Fresno, or South Lake Tahoe, in California (Figure 2). Buses could carry tourists north from Ontario or Las Vegas with options to visit Death Valley National Monument, the Inyo Complex, and Yosemite National Park, Lake Tahoe, or Reno, and naturally the order could be reversed. Regardless of the arrival or departure points of the tours, several days could be spent at the heart of the Inyo Complex -- in the towns of Bishop or Mammoth Lakes -- from whence satellite tours could originate. One might think that tourists would be unwilling to ride a bus to Mammoth Lakes from Ontario or Las Vegas. Yet, according to a bus tour director, her group had traveled from Palm Springs through Mammoth Lakes to the Mono Lake Visitor and was departing for Yosemite. Palm Springs is more distant than Las Vegas by about 30 miles.

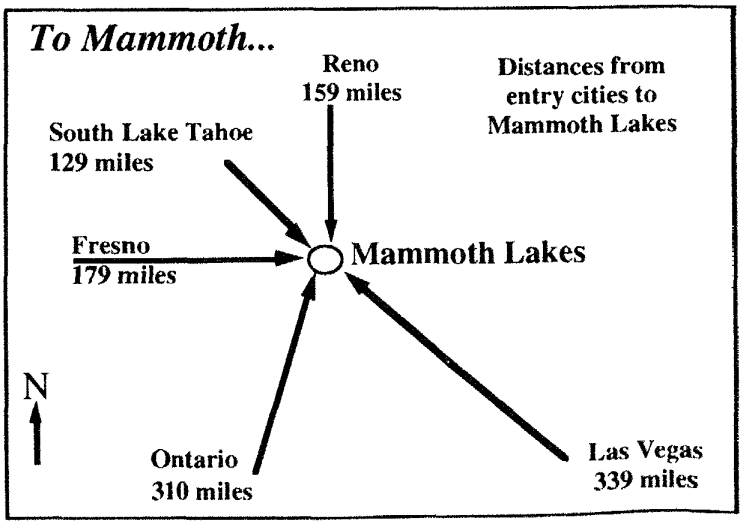


Figure 2. Mileage from entry/departure airports to Mammoth Lakes, California.

Marketing Our Wildlands

On the surface, increasing international tourism by marketing clustered natural resources may seem implausible. The skiing industry, however, found international visitors to be "inquisitive and curious once they get to the United States" (O'Connell 1992). They like the "Have-a-nice-day" attitude of businesses, the quality of our "average" hotel room, and the perception that "everything works." Now, the skiing industry is promoting tourism by marketing "the history, culture and the uniqueness of each part of the United States" to international visitors, and is suggesting that international tourism can be increased only if its members join forces. This approach seems plausible for other tourism-based businesses and communities. In this light, "The Inyo Complex" may be a feasible tour package, but it may not be easy to establish.

Recently, an informal group called CURES, the Coalition for Unified Recreation in the Eastern Sierra, was formed by representatives of local businesses; special interest groups; chambers of commerce; Federal, State, and local government agencies; and a visitor bureau. Its purpose is to improve tourism and recreation services in the eastern Sierra region of California. Even though CURES provides the kind of organization needed to make an Inyo Complex feasible, its marketing and other information is being focused only at domestic tourism. Considerably more effort will be necessary if the program is to entice international visitors.

Some Marketing Concerns

Marketing is a process aimed at identifying what people want and providing it for a fee. In essence, the skiing industry has shown that foreign tourists do aspire to vacations in the United States, especially after an initial visit (O'Connell 1992). Previously unrecognized interests of foreign visitors include forests, beaches, natural wonders, ruins, and cultural diversity, along with opportunities for gambling and shopping (Edgell 1990).

Some will question the marketing of our outdoor recreation resources. Yet, fragile and scarce resources may be protected through sound marketing that leads tourists away from easily damaged locations and offers experiences more attuned to their expectations for resource visitation and support service (Knopf 1990). Providing tourists with opportunities and services in keeping with their social orientations and dependence on facilities, may make tourism more acceptable to environmental groups that seek protection of fragile resources. In addition, marketing scarce resources for tourism has the benefit of promoting wise use by informing visitors of the need to "protect the integrity of our most threatened and vulnerable environments," and giving them some opportunity to experience something new (Knopf 1990, p. 61). In this manner, tourism may serve as an interpretive tool to foster international environmental conservation.

Local people may object to the increased crowding, traffic, and competition for resource use. Thus, for tourism to be successful, support of local residents is essential (Keogh 1990). On the other hand, locals see the obvious benefits of tourism (jobs and income), and also may regard improvements in infrastructure and services as benefits to themselves as well as to tourists (Keogh 1990). Establishing and marketing tourism complexes may not only increase service exports and help reduce the nation's trade deficit, but offer hope to "bolster sagging rural economies" (Knopf 1990). Clearly, local people must be involved in planning and development for tourism.

Attitudes and Resistance to Tourism

People with a variety of interests--businesses, chambers of commerce, environmental groups, local citizens, and governmental agencies including natural resource managers--must interact and establish commonalities for a tourism complex to be established, marketed, and serviced. Therein may lie the most difficult problem--communication, especially between natural resource managers, the professionals in tourism with whom they must work, and the publics both serve. Furthermore, the communication problem may not rest entirely with resource professionals; people in tourism businesses may contribute as much to barriers to effective interaction as do resource managers.

Travel agents, brochures, and pamphlets are important sources of information for international travelers (O'Leary 1989), yet travel agents tend not to contact resource managers to obtain or verify information (Pfister 1992). Consequently, tourists may appear without warning, and managers may not be prepared to provide services expected by the tourists. This situation suggests that travel agents, who one would expect to have a strong social orientation, may be as reluctant as resource managers to initiate interactions necessary to verify itineraries. Of course, travel agents simply may not know where to obtain some of the information they need.

Whose Job is It?

"Managing for recreation is complicated" (O'Leary 1989, p. 13). Managing for tourism, however, may be more "complicated" as a consequence of the complex interactions needed to plan, market, and service tourists. The complexity associated with the interactions of many different people and groups may present abstract problems with no correct formulation, no evidence to indicate when solutions are found, and no test for objectivity --problems termed "wicked" by Allen and Gould (1986). Also, considering that resource managers do not deal well with abstract problems, are predisposed to autonomous action, and are disinclined to initiate social interaction (Magill 1991), the outlook for developing international tourism on our public lands seems bleak.

"Wicked problems" may grow as interactions become more frequent among people who provide travel services. Any of them may feel a reluctance to interact with others even though working with people is an integral part of their business. Resource managers, on the other hand, are more inclined to perceive their job as managing and protecting resources (Magill 1988), thus they are less likely to start the interactions necessary to increase tourism on the lands they manage. Obviously, somebody must assume leadership if efforts to increase resource-based tourism are to commence, let alone succeed.

Assuming leadership of the diverse assemblage of people needed to increase international visits to wildlands seems an unlikely role for resource managers who are known for their affinity to deal with "things" rather than people. Nevertheless, it is because of their unique knowledge of natural resources and familiarity with specific areas, that they may be ideal champions for the effort. Thus, to gain the "edge" needed to assume leadership of a resource-based tourism program, resource professionals are advised to develop greater sensitivity to public opinion, obtain more training in the social sciences, avoid using technical jargon in public speaking and writing, use language appropriate for the public, and seek improved career guidance for prospective students (Gallagher 1988; Gallagher and Patrick-Riley 1989; Magill 1991). In addition, they should obtain knowledge of the cultures of prospective international visitors and offer them some familiar situations thereby avoiding unfavorable interactions and making themselves better hosts.

Over the past decade, a change has occurred among the professional disciplines of some natural resource agencies. The ranks of the biological and engineering professionals have been infiltrated by persons from socially oriented disciplines--sociology, archaeology, anthropology, social psychology, and political science. These people are contributing new viewpoints to the traditional scientific perspectives of natural resource professionals. These "new ways of thinking" may contribute substantially to the awakening of resource professionals to abstract approaches for solving problems, and for serving people--be they U.S. citizens or foreign tourists.

Conclusions

Responsibility for establishing the relationships needed for effective communication among people in the tourism industry and natural resource management may rest with natural resource managers. They already have a specific responsibility to support government programs that encourage the economic and social development of rural communities. Though less obvious to managers, they also should contribute to efforts to reduce the nation's trade deficit. Both goals may be served through increased visits by international tourists to our public lands.

The tourism industry is unlikely to feel any responsibility to foster either rural areas development or trade deficit reduction without external encouragement. They are, after all, in business to earn a profit. Therefore, natural resource managers may need to set aside their reluctance to public interactions and take leadership in garnering support for a tourism strategy for our wildlands.

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ENVIRONMENTAL FACTORS IN GOLF COURSE DEVELOPMENT: A CASE STUDY

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Environmental constraints become apparent when one considers the maintenance and operation of a golf course. The high demand for water, proximity to surface or ground water supplies and the potential threats by the perpetuation of the grounds. This investigation of a new golf course construction site will identify the threats to the environment.

Introduction

Every year, another 350 or so new golf courses are created in the United States to help meet the growing demands of the nation's 27 million golfers. The country's more than 14,000 golf courses currently cover 13.2 million acres (Kuznik 1993). These sites are often selected for their natural characteristics. According to the last Massachusetts State Comprehensive Outdoor Recreation Plan (Smith et al. 1988), nearly 7% of the residents indicated that they participated often in golfing. Golfers typically participate 24 times a year and travel an average 15 minutes to the course. Most golfing occurs on the weekends (SCORP 1998). Despite the nearly 400 courses in Massachusetts, the high relative demand for golf courses has caused the SCORP to identify golfing as second in the State Need Rank, following tennis court construction. Warnick (1991) has studied golfers in New England and found the market share to be different from the national trends. For example, although popular, nationwide trends indicate a propensity to utilize country clubs over the public ones. Regionally, golfers utilize the private and public facilities more equally.

In Southwick, Massachusetts, there are currently two golf courses (the Edgewood Golf Course, Inc. and the Southwick Country Club) and one driving range (the Longhi's Driving Range). In the near future Southwick will also have a new golf course, to be created on an existing dairy farm. The impacts of this new golf course and the already existing courses bring up issues of clear cutting, erosion, siltation, effects on nearby streams, aquifer protection, the flood plain, and wetlands.

Early golf course architecture traditionally tried to work with the shaped of the land. Then in the 1960's, builders began moving a lot of dirt around, trying to create unique looks. At many courses, native understory and woodlots were replaced by huge growths of grass and beds of ornamental and exotic plants. Vast amounts of water were required to maintain those large expanses of open turf. The average golf course uses more pesticides, herbicides, fungicides, and fertilizer per square foot than any farm in America. This may create an over burden to the land's filtering ability to chemicals before drainage reaches the water supply, for example, Southwick's aquifer. The National Golf Foundation says that between 500,000 and 800,00 gallons of water per day per course is needed for the upkeep of these layouts (Kuznik 1993). Such a drain on the natural water supply system in any community is a matter for investigation.

Traditionally, golf course construction averages $3 to $6 million, with higher quality and environmentally sound courses averaging $10 million. According to Laurence Hirshm, President of the Society of Golf Appraisers, these initial construction costs take an average of twenty-five years to pay for themselves (Hirshm 1993). Therefore there is no great monetary incentive to build the more expensive version. There is no question that public golf courses can make money, they are also good neighbors and can be politically desirable additions to a community. After all, courses are labor intensive and can require a minimum of 145 employees for operation and upkeep. The tax revenue would be a boost to community funding deficiencies, but environmental factors, if ignored from the onset, could cost communities in the long run.

Background on Environmental Factors

From the standpoint of investigation, a proposed construction site of any kind, and in this instance, a golf course construction site, the surface of the Earth is comprised of a complex interface where there are four principle components of the environment to be considered. The solid, inorganic portion of the earthly sub-structure is the lithosphere, comprised of the rocks of the Earth's crust as well as the broken and unconsolidated particles of mineral matter, the soils, that overlie the unfragmented bedrock. The vast gaseous envelope of air that surrounds the Earth is the atmosphere. The atmosphere encompasses the climatic factors of wind, precipitation, temperature, and seasonal attributes. The waters of the Earth, consisting of oceans, lakes, rivers, and glaciers, compose the hydrosphere. The hydrosphere is entwined with the other spheres to supply life giving moisture. Finally, all living things, plant and animal, collectively comprise the biosphere. These four spheres, when under study, are not discrete but are considerably intermingled. Consider the composition of a lake. This body of water from the hydrosphere also contains organic life forms that are a part of the biosphere. Soil, for example, is composed of largely bits of mineral matter (the lithosphere), but also contains life forms (biosphere), soil moisture, (hydrosphere), and air (atmosphere) in pore spaces. Thus, lithosphere, atmosphere, hydrosphere, and biosphere are not separate systems within a site analysis, but are more properly considered as components of the total environment.

Because of these environmental factors, the U.S. Environmental Protection Agency has developed policies to analyze a projects' responsible land stewardship needed on golf course development and maintenance. For example, the United States Golf Association (USGA) has granted the Professional Golf Association of America $400,000 for the analysis of the impacts on a golf course located in South Carolina (Kuznik 1993). Studies of this kind are being conducted all over the country. The environmental impacts of maintenance are secondary considerations. The construction of the course must be analyzed first. After surveying of the site has been completed from the air and field work, the site planning begins. Natural land formations, wetlands, waterways, vistas, historic points of interest, and so forth are developed into the plan. Today, sites are pre-selected to capitalize on unique topographic features. This eliminates the need for extensive landscaping techniques. Natural features and attractions of a site become the allure of a course.

Lithosphere

Soil analysis has now become very important when considering placement of the manmade features of a golf course. Clear cutting, erosion factors, drainage patterns, and siltation all need to be considered. Because the lithosphere is linked to all other spheres to be considered any impact must be cross-checked to predict consequences to other spheres. For example, excessive erosion from clear cutting may irreversibly harm nearby streams and groundwater. Habitat lost during clear cutting may also impact native species that are part of the course's future uniqueness. Disturbance of drainage patterns may have reverberations to other spheres as well. Analysis of a site has to be checked against every sphere for the interconnectedness of every step into every realm for the consequences of each step.

Biosphere

The distribution of plants and animals reflects evolutionary adaptation, migration competition, and reproductive changes over

time. Extermination and extinction are hidden threats to any landscape. Wildlife habitats are usually very sensitive to construction processes and must be protected during the site plan development, before the construction of a course has damaged them beyond repair. Jim Snow, as an USGA official currently funds $2 million a year in environmental research (Kuznik 1993) to study these impacts and how to mitigate them. More than 600 golf courses have enrolled in the Audubon Cooperative Sanctuary Program, an environmental advisory service operated by the New York Audubon Society to help preserve special areas at the onset of a project. The American Society of Golf Course Architects recently pledge to design future courses following Audubon guide lines. "The involvement of all of these institutions shows that people are starting to see that they can have good quality playing areas and also create little pockets of habitat," says New York Audubon President Ron Dodson (Kuznik 1993, 36). These organizations are all beginning to work together instead of being adversaries who do battle over the environment. Golf courses offer each party incentives worth working toward while the creation of the site plans opens these areas to public use.

Hydrosphere
The PGA hopes to foster similar changes in attitudes. PGA spokesman Ron Kendall believes, "As long as they obey the laws, people have a right to develop private property. If we are going to continue to build and maintain golf courses in this country, then we must protect the environment at every step of the process (Kuznik 1993:37)." The hydrology of a site is critical to life in the biological sphere of the course to be developed as it is to the humans who share these resources in the area. Water is the factor which links the four subsystems of the Earth. Its importance to life on the surface cannot be over emphasized. Wetlands serve a purpose to the life that it supports, but can be utilized for the further benefit of a golf course in the form of a water source if planning is carefully calculated. Groundwater is perhaps the most mysterious of all storage areas for water because we cannot see it during our daily lives. The proximity to surface or ground water is imperative to turf management and these supplies have to be protected as do other water bodies in an area. Groundwater can be depleted beyond its ability to replenish itself and precision is of the utmost significance when placing septic systems and when designing chemical storage and usage. If the local water supply becomes contaminated during the construction and further upkeep of a golf course through poor planning, of what worth will the course hold down the road. Contaminated water will not make the course easy to maintain to say nothing of the detraction to future users. Wildlife, both animal and vegetation, will not be able to withstand changes to its' water supply, so consideration of all impacts to the hydrologic sphere must be of great importance to the site development.

Atmosphere
Finally, every one of the other spheres have developed under the influence of the atmosphere. It is this sphere that is responsible for certain characteristics of the soil composition, the vegetation, the animal populations, and the water conditions of a site. When taken into the calculations for a golf course, the atmosphere envelopes existing conditions and future conditions. The position of the sun will influence the growth of the vegetation and also the maintenance of the grounds. The climate of an area will influence the amount of natural sun and water that will be contributed, as well as how many playing days can be expected. These climatic changes in the seasons will layout the pattern of its average temperature, rainfall, and influence maintenance practices. The wind created by the direction and intensity of the pressure fields of the atmosphere extend into play when it comes to helping to shorten the drying time after rain storms, influence the daily weather, and will influence the use of airborne chemicals for the subsistence of the course. Another condition created by the climate is humidity and it can greatly effect the degree of comfort experienced by the users of the course and may change a sunny day of golf into a day to stay at home.

Massachusetts Golf Trends

Southwick's Newest Golf Course
Golf legend, Sam Snead and California architect, Robert Muir Graves have teamed up to design a proposed $7 million "championship caliber" 18-hole golf course on the 330-acre Sunnyside Ranch dairy farm owned by the Hall family (Graves 1993). There are plans to convert present structures (two residential homes and barns) into the golf pro shop, locker rooms and a restaurant. The bulk of the land will not be radically altered according to David Hall, the developer. Both Snead and Graves are famous for being naturalists and like to work with the topography of the land instead of creating artificial hills and obstacles. The crossroads that the Halls have come to is one dairy farmers throughout the region and New England increasingly must face. Sunnyside is one of the five remaining farms in Southwick, a town once renowned for its remarkably rich soil, a town that in the early 1800's counted farming as its top industry (DiLorenzo 1994). For many farm families today it has become nearly impossible to preserve the lifestyle that has sustained them for generations.

Snead, Graves, and Ed Bignon, former vice-president and chief operator of the Arnold Palmer Golf Management Company, will attempt to design a playable championship course in its natural setting of meadows and forests. With minimal landscaping, this property offers extensive views of the East Berkshire mountains and has eastern exposure for sun light drying of the course throughout the year. The main goal of the group is to offer a profitable recreational facility to the public without changing any more of the land than is necessary to build the course.

Lithosphere. The soil is comprised of Wethersfield-Mekesville types. These soils consist of characteristics that are shallow to bedrock, well drained to moderately well drained soils with hardpan under 15% slopes. This will work well with management techniques for the course maintenance, but it also brings into consideration Southwick's Great Brook aquifer. Septic systems, herbicide and pesticide usage, and the creation of wetlands for habitat might run into problems with this type of soil. Well drained soils will necessitate the development of septic systems which can operate efficiently and filter out wastes before they contaminate the aquifer. Herbicide and pesticide usage will need to be used as supplements to organic methods of turf management in order to reduce possible contamination during these practices. Wetlands construction will need to be located in soil areas less prone to natural drainage, otherwise they will be dry most of the time. This would eliminate any thought of using water from these areas for irrigation.

Biosphere. There are many biological issues to be directly dealt with on this 330-acre site. This project site provides habitat for wildlife of a wide range of species. This wildlife includes migrating Canadian Geese, native wild turkeys, redtail hawks, and over sixty other bird varieties including songbirds, owls, other game birds, such as pheasants. The Massachusetts Audubon Society has been advising the plan designers as to the creation of alternative habitats and protection of existing habitats here. The Hall family has also discussed the donation of 50 acres to the Society to help with the advancement of species in this sphere, such as trying to make feeding grounds more enticing to the migrating geese than the course grasses. This will be quite an endeavor for geese flock to good feeding grounds and over crowd them until the bounty is gone. The reintroduction of endangered or threatened species of birds, such as the Bald Eagle, the American or peregrine falcons, may also become part of the project.

This habitat created will provide undisturbed homes to the whitetail deer, red and grey foxes, assorted moles, mice, squirrels, rabbits, and others such as, opossum, woodchucks, and raccoon, as well as other species natural to the area. The vegetation consists of second growth forest and pasture with wetlands created in areas convenient to the traditional farming practice on the property. Maple, pine, oak, and birch trees are found abundantly throughout the property along with various berry

bushes, laurel, dogwood and fern plants are also in abundance (Cortell 1980).

The Southwick Conservation Commission will be an active participant in the planning (O'Brien 1992), for these and issues of wetland protection, soil erosion, waterway protection, aquifer recharge, and other issues. The designers have tried to anticipate problems by involving organizations in the area and addressing their concerns before they begin. By taking this approach they hope to plan better for the course development and to handle problems in the early stages instead of being blocked by an environmentally concerned group at some future stage of development. This will surely help with the public relations and support of the project because any problem unforeseen by design will not become hindrances by concerned groups in the advance stages. After issues of the biosphere are identified and endangered or threatened species, if any, are recognized, issues of the lithosphere, atmosphere, and hydrosphere must be considered.

Hydrosphere. Organic methods of turf management would decrease any impact to the aquifer, especially in the borderline areas in question. Located within the borders of this property are streams which connect with other tributaries in the large water system of the area which eventually impact upon the water supply of the area which is already taxed by Southwick's water usage and by the towns of West Springfield and Westfield (Water Resource Commission 1968). There would also be a minimal effect on surface waters, both existing and those to be created, if organic methods were practiced. The hydrologic sphere will be impacted, in the construction plans, which calls for the relocation of the current wetlands and the creation of some 20 acres of wetlands. This will be allowed under the Wetland Protection Act because the wetlands were created by the farming practices of a great many years ago and are considered manmade not natural wetlands. The Wetland Protection Act (WPA) allows for these areas to be adjusted to land use due the to fact that their creation was to promote farming practices of a time before the WPA went into effect. Above ground storage of fuels and chemicals in a protective manner would also be recommended.

Atmosphere. The atmospheric aspects of the environment are ideal for the proposed golf course as they were for the former farming practices. The climate will allow approximately 165 days of playing season. The eastern exposure to sunlight will allow for quick drying of the course after rain storms and prevailing winds will also quicken the drying time of the greens. The winds, however, will preclude airborne spraying techniques in some areas of the course due to neighboring residential development. As the winters in this climate tend to be cold and with a medium degree of snowfall, other options can be explored to utilize the course in off season time periods. Cross-country skiing or another low impact use could be open to the public and therefore make for a more constant revenue producing site. Rainfall will be plentiful in the Spring of most years, but constant watering is a good possibility in the hot, humid summer which could otherwise damage the greens by overdrying them.

Conclusions

There are beneficial economic objectives to be obtained from the proper construction of another golf course in the community of Southwick, such as, tax revenue, employment opportunities, and a hopeful ripple effect to other businesses in the Town. Recreation planning is a process that relates the leisure time of the people to space. This process results in plans, studies, and information that condition public policy and private initiatives used to provide leisure opportunities. In the broadest sense, recreation planning of this type is concerned with human development and the stewardship of the land. It helps the people relate to their environment and to each other. In a narrow sense, recreation planning is most concerned with the variables of leisure behavior and open space. Concerns about the natural preservation of this area as open space, is also of importance to the public because it helps to reduce residential development in this area of town and helps to maintain the rural character of the community. The historic significance of the four generational farm will be maintained by the barn which reads "Sunnyside Farm" and the location of a historic inn site with a scenic view in two directions.

Emerging in many communities is an emphasis on citizen participation in the planning and design process, environmental and social impact assessment, the necessity for cost-effective investments, and the requirements of special populations. This emerging emphasis blends environmental design, social science, and public administration to provide leisure opportunities. Serious consideration of performance criteria, precedence and practice need to be incorporated into a long range, comprehensive, and policy oriented plans. Elements of this plan should identify problems, present relevant information on the implications of a project, and include problem solving alternatives listing expected results. These alternatives need to be listed in terms of economic, social, environmental, and political feasibility.

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ATTITUDES TOWARD SUSTAINABILITY AND REGULATION OF STRIPED BASS BY CHATHAM FISHERMEN

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Striped Bass are a varying source of income for 131 Striped Bass commercial fishermen from Chatham, Massachusetts. For some it is the main source of income until the harvest limit of 238,000 lbs. is reached, then alternative fisheries must be sought. The purpose of this descriptive study was to investigate licensed Chatham Striped Bass fishermen beliefs about the sustainability of Striped Bass fish stock and attitudes toward regulations of the fisheries. No significant statistical differences in beliefs about sustainability or attitudes toward regulations could be discerned between those commercial fishermen who rely on Striped Bass as their primary source of income and those who don't. Chatham commercial Striped Bass fishermen are generally positive in their beliefs about the sustainability of the bass and attitudes toward regulations, but believe that harvest allotments could be increased and that greater coordination is needed with other states.

Introduction

The harvesting of the Striped Bass *(Roccus saatius)* gained early prominence as a commercial fish and more recently as a sporting fish. The largest population of this species migrates yearly along the Atlantic coast from the Chesapeake Bay to Massachusetts. Over the years the sporting qualities and demand for this fish as a seafood delicacy resulted in over harvesting; fisheries management was subsequently introduced which imposed regulations governing size (minimum of 36") and season (determined by total weight harvested). Other regulations have focused on the licensing of harvesters. All Striped Bass fisherman, sport or commercial, who wish to sell their catch are licensed, families may also obtain a permit to catch and keep one fish per week for personal consumption. Because of the demand for the Striped Bass by both sportsman and those who depend on it for their livelihood, conflicts have developed. Commercial fishermen believe they should have prominence over sportsmen and be able to increase their total catch. The harvest allotment is currently limited to 238,000 lbs. per year. Little is known, however, about the attitudes of these commercial harvesters regarding the sustainability of this fishery or their views toward the regulations that have been implemented.

The purpose of this research is to examine the differences in attitudes toward the sustainability of the Striped Bass and management regulations between those who are licensed full-time commercial fisherman and those who are licensed but considered to be part-time because they do not depend on the fisheries as their primary source of income. Two research questions drive the study: 1) what are the attitudes of licensed fisherman toward the sustainability of the resource stock and their attitudes toward the current regulations; 2) are there differences in attitudes between commercial full-time and those labeled as part-time anglers toward the sustainability of striped bass.

Methods

A mail questionnaire was sent to a census sample of the 1993 Striped Bass license holders of the town of Chatham, Massachusetts. This list of license holders was obtained from the Massachusetts Division of Marine Fisheries. The list consisted of 131 names and addresses. A single mailing to license holders was used due to the limited budget of the researcher. Included in this one time mailing was a cover letter, the survey questionnaire, and a self-addressed stamped envelope to return the survey. The fishermen were questioned about their opinions and attitudes toward the sustainability of Striped Bass, attitudes toward regulations, and their support for increases in minimum size and harvest allotment. To distinguish between full-time commercial fishermen and part-time fishermen, who may sell their catch commercially, a question was asked about whether the respondent's harvest of Striped Bass was the main source of their income during the bass season. Responses were analyzed using StatView statistical package.

Results

Of the 131 surveys mailed to Chatham license holders, three of the surveys were undeliverable due to an invalid address. Eighty one of the deliverable surveys were filled out and returned, representing a 62 percent return rate.

Approximately twelve percent of the respondents indicated that the harvesting of bass was the main source of their income during the Striped Bass season, 87.7% responded that it was not the main source of their income, even though they were licensed to sell their catch commercially. Twenty five percent of the respondents had been Striped Bass fishing 10 years or less, 21% have fished between 11 and 20 years, 28% have fished 21 to 30 years, and 27% indicated they had been fishing 31 to 60 years.

Decline of Striped Bass

Approximately 46 percent of the respondents believed Striped Bass were declining, almost 40 percent disagreed (Figure 1). This indicates a generalized split in opinion among the commercially licensed Striped Bass fishermen

Current Rate of Harvest and Species Sustainability

Figure 2 indicated that about two thirds (64.2%) of the respondents believe that if the current rate of harvesting is sustained, future populations of Striped Bass will be assured. About a quarter of the respondents disagreed. Comments from respondents indicated that many believed increased harvests could be supported.

Current Regulations

Three out of five (59.6%) of the respondents believed that with the current regulations enforced, the future of the fish will be assured (Figure 3). Almost one quarter (23.5%) take a neutral position to ward this question This indicates that commercial fishermen appear satisfied with the current regulations but believe enforcement is needed.

Sufficient Striped Bass for Commercial and Sport Fishermen

Slightly less than three quarters (71%) of the respondents believe that there are enough Striped Bass for both the sport fisherman and the commercial fisherman. Approximately 13.5 percent feel that there are not enough for both, and 16.1 percent are neutral to this statement. (See Figure 4.) Chatham license holders appear to maintain a consistent belief that there are sufficient striped bass for harvesters.

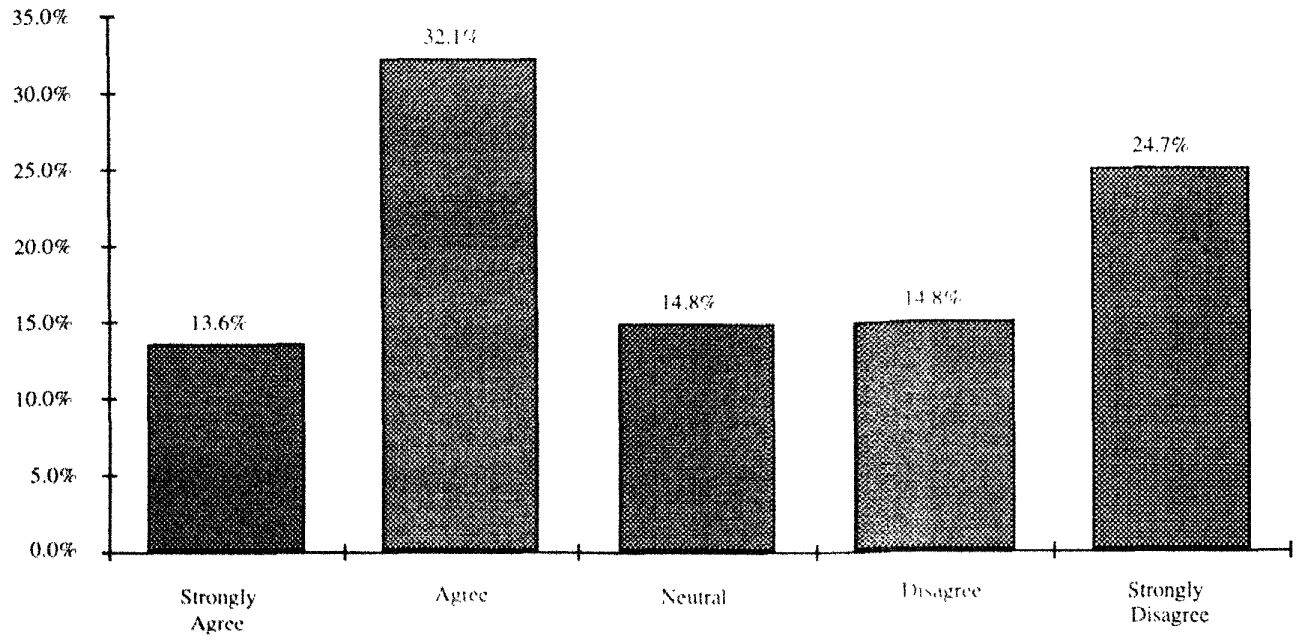


Figure 1. Number of Striped Bass have declined since respondent began fishing.

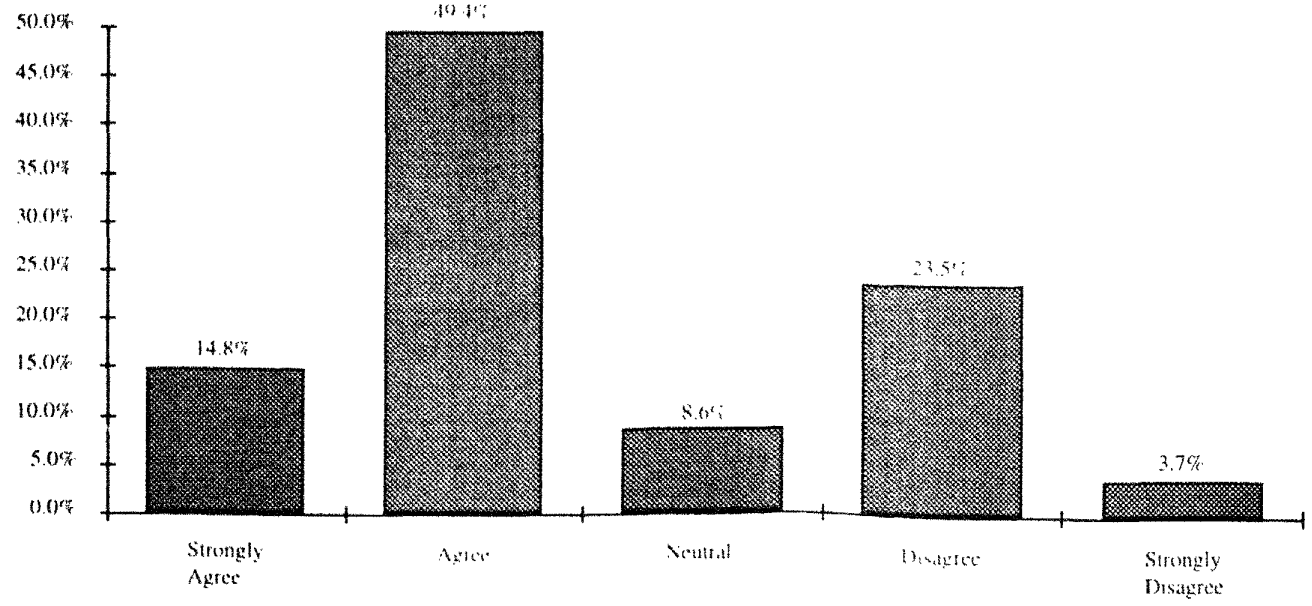


Figure 2. Respondents agreement that the current rate of harvest will assure sufficient populations of Striped Bass.

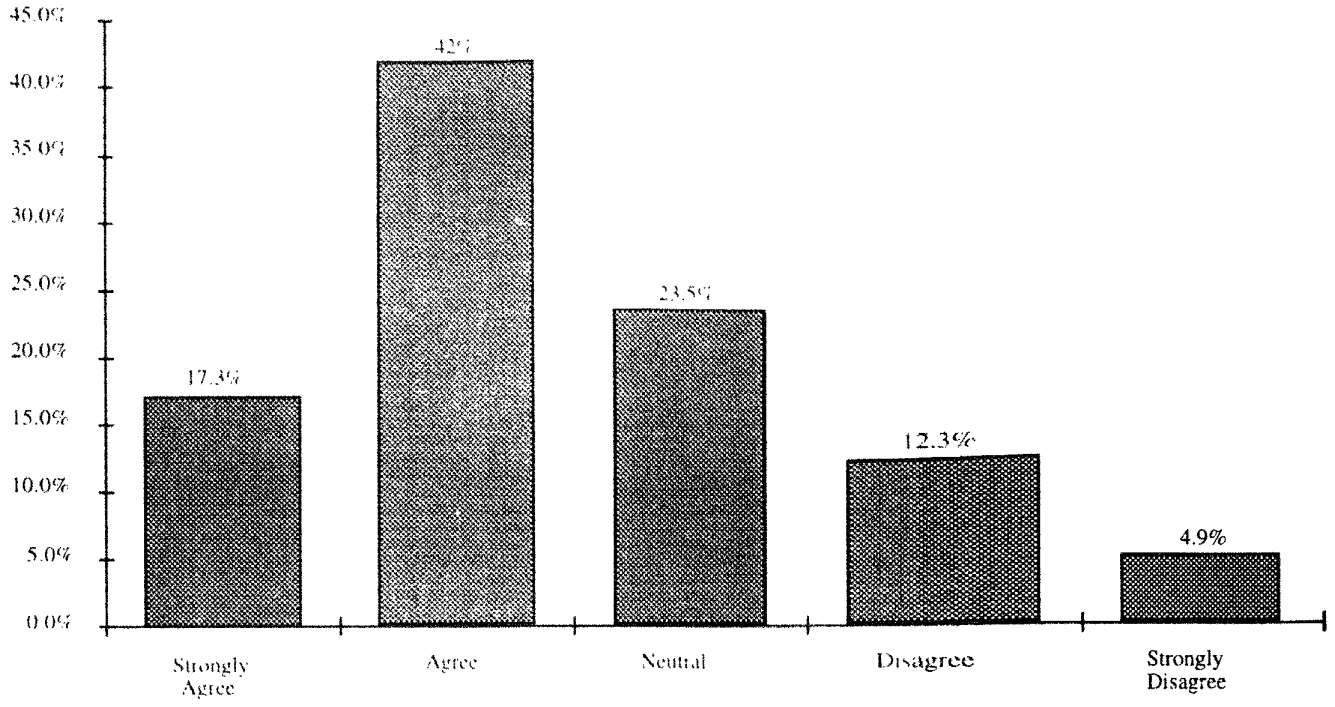


Figure 3. Enforcement of the current regulations will assure the sustainability of Striped Bass.

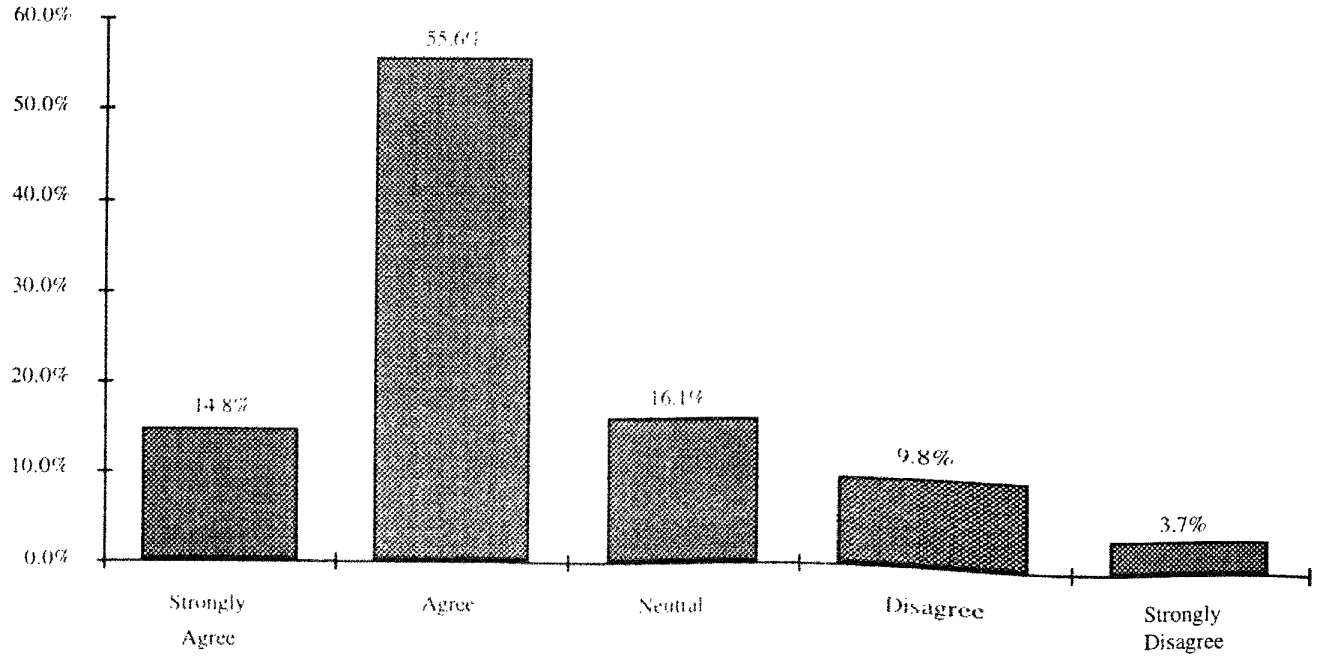


Figure 4. Sufficient Striped Bass for both sport and commercial fishermen.

The results of chi-square analysis indicated no significant relationship between the type of fishermen and attitudes toward the sustainability of Striped Bass. Similarly, there was no relationship between type of fishermen and attitudes toward enforcement of regulations governing their harvesting (see Table 1). Those who harvest Striped Bass as a primary source of income during the season had a greater percentage of respondents who agreed that the number of Striped Bass had declined and that current levels of bass were sufficient. Not unexpectedly, a greater percentage of those who harvest Striped Bass as a primary source of income also believed that over-harvesting by sport fishermen was a the main reason for poor commercial fishing. A larger percentage of part-time harvesters (i.e., not the primary source of income) believed that the current rate of harvesting would assure future populations of the species.

Table 1. Attitude differences between full and part time commercial fishermen toward sustainability and regulation of Striped Bass.

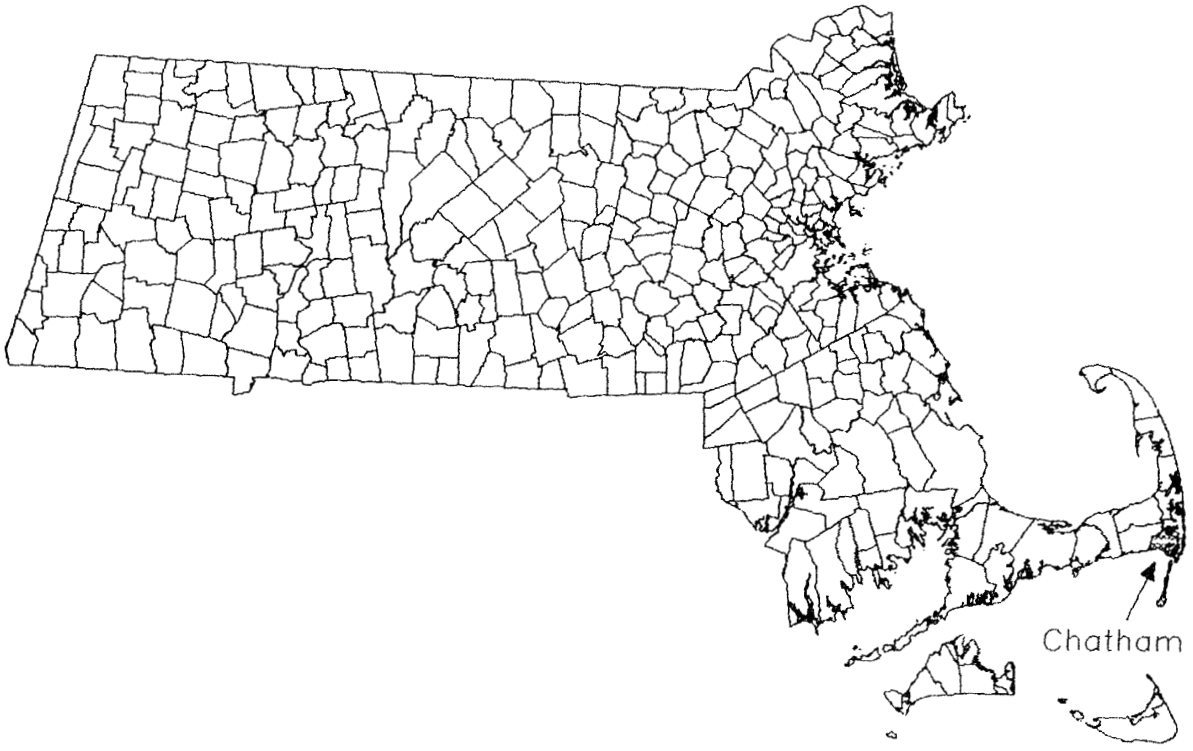
	Agree		Disagree		Neutral		
Issues	Primary Source of Income	Not Primary Source	Primary Source of Income	Not Primary Source	Primary Source of Income	Not Primary Source	Chi-Square
	(Percent)	(Percent)	(Percent)	(Percent)	(Percent)	(Percent)	
Number of Striped Bass have declined	60.0	43.7	40.0	39.4	0.0	16.9	3.246*
There are sufficient Striped Bass for commercial and sport fisherman	80.0	69.0	10.0	14.1	10.0	16.9	0.930*
Over-harvesting by commercial fisherman is main reason for poor commercial fishing	20.0	26.8	70.0	60.6	10.0	12.7	2.405*
Over-fishing by sport fishermen is main reason for poor commercial fishing	40.0	26.8	50.0	49.3	10.0	23.9	1.376*
Current rate of harvesting Striped Bass will assure sufficient future populations	50.0	66.2	40.0	25.4	10.0	8.5	2.853*
Through enforcement of current regulations the future of Striped Bass will be assured	60.0	59.2	10.0	18.3	30.0	22.5	1.348*

Discussion and Implications

Those who harvest Striped Bass as a primary source of income (i.e., full-time fishermen) and those who are part-time harvesters of Striped Bass have similar positive beliefs about the sustainability of Striped Bass fisheries and hold similar attitudes toward enforcement of regulations on harvesting. Both groups, however, would like to see an increase in the total harvest allotment beyond the current 238,000 lbs., but over eighty percent of the fishermen believe the size limit should remain at 36 inches. This suggests that if the issuance of licenses remain at the same level, marine fisheries managers would have support in increasing the harvest allotment, enabling the Striped Bass season to be maintained for an extended period of time and enhancing the economic return for commercial fishermen in the Chatham area.

While Chatham, Massachusetts fishermen support the 36" limit on the minimum size of Striped Bass to be taken, many of the respondents commented that greater coordination is needed with other states along the migratory path of the bass. Striped Bass migrate along the eastern seaboard, spawning in Chesapeake Bay and Hudson River then migrate north along the coast in the late spring. Currently two other states allow harvesting of Striped Bass at 28 inches, depleting the stocks of smaller fish and spawners. As a result, Massachusetts fishermen are more stringently regulated and their potential economic return is limited. This may explain why relatively small numbers of the Chatham commercial harvesters rely on Striped Bass as their primary source of income. Massachusetts Marine Fisheries managers may have succeeded in educating the commercial harvesters about the necessity of regulations for maintaining the sustainability of the fish stock, but they should address the issue of coordination with other states to quell the growth of the seeds of discontent expressed by these commercial fishermen.

Town of Chatham



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