

Table of Contents

Public Sector Recreation Administration & Management

| | |
|--|---|
| Conserving Open Space in New York State | 3 |
| <i>Robert W. Reinhardt and Shaun Keeler</i> | |
| Recreational, Scenic, and Existence Values in Conservation Easements Held by Private Land Trusts in the Northeast | 6 |
| <i>Steven Bick and Harry L. Haney, Jr.</i> | |

Education Issues in Recreation

| | |
|--|----|
| Exploring the Virtual World of Recreation: Distance Learning on the Internet | 13 |
| <i>Robert S. Bristow</i> | |
| The Effects of Environmental Coursework on Student Perceptions of the Environment | 18 |
| <i>Alan D. Bright</i> | |
| Motivation to Volunteer at Shaver's Creek Environmental Center | 23 |
| <i>Thomas D. Wickham and Alan Graefe</i> | |
| Student Willingness to Pay More for a Tourism Experience which Supports Environmental Conservation | 28 |
| <i>Wendy Garpow, Mindy Habicht and Rob Robertson</i> | |

Policy Issues: Partnerships and Collaborations

| | |
|--|----|
| Enhancing Tourism Development Through Partnerships | 37 |
| <i>Norman K. Bender</i> | |
| An Examination of Effectiveness in the Collaborative Management of Natural Resources | 42 |
| <i>Michael A. Schuett, Steven W. Selin and Deborah S. Carr</i> | |
| Archaeology at Aldrichville: An Education and Recreation Partnership | 46 |
| <i>David M. Lacy, Sheila Charles, Debra Gardner-Baasch and Michael Barbieri</i> | |
| Philanthropy and Collaborative Planning: a Case Study | 48 |
| <i>Jefferson D. Armistead</i> | |

Contemporary Issues in Recreation

| | |
|--|----|
| A Comparison of Wilderness Privacy Within Two New York State Wilderness Environments | 51 |
| <i>Cathy L. Fuller and Chad P. Dawson</i> | |
| Recreation Specialization, Amateur/Professional Leisure, and Level of Development Applying Outdoor Recreation and Sport Concepts to Quiltmakers | 57 |
| <i>Sharon L. Todd</i> | |
| A Rail Structure Disposition Process for Pennsylvania's Rail-Trails | 63 |
| <i>Andrew J. Mowen, Gary L. Gittings and Alan R. Graefe</i> | |
| Snowmobilers' Perceptions of Danger and Their Relationship to Fatal Accidents | 67 |
| <i>Joel A. Lynch and Charles M. Nelson</i> | |

Heritage and Cultural Tourism

| | |
|--|----|
| Museums and Cultural Institutions in Michigan: a Foundation for Heritage Tourism | 71 |
| <i>Gail A. Vander Stoep</i> | |
| The Importance of History in Recreation Research | 77 |
| <i>Karl Roenke</i> | |

Environmental Concerns in Recreation

| | |
|---|----|
| Size of Place of Residence and Encounters With the Adverse Consequences of and Support for Commercial/Industrial Development | 81 |
| <i>Robert A. Robertson and Rabel J. Burdge</i> | |
| A Study of Information Search by Visitors to the Blue Ridge Parkway | 86 |
| <i>Jim Rogers and Roy Ramthun</i> | |
| The Utility of a Uses and Gratifications Approach to Assess the Information Needs of Forest Visitors: An Activity-Based Market Segmentation Test | 93 |
| <i>James D. Absher</i> | |
| Information Use in the Trip Planning Process: a Qualitative Analysis of Backpackers | 97 |
| <i>Roy Ramthun</i> | |
| The Association of Outdoor Recreation and Environmental Behaviors | 99 |
| <i>Gene L. Theodori, A.E. Luloff and Fern K. Willis</i> | |

Outdoor Recreation Management

| | |
|--|-----|
| Pricing Public-Sector Recreation: a Functional Perspective | 107 |
| <i>Thomas A. More</i> | |
| An Experiment in Progress -- Permitting Pets in Selected Florida State Park Campgrounds | 111 |
| <i>Andrew Holdnak and Stephen M. Holland</i> | |
| Applying Recreation Specialization, Willingness to Pay and Willingness to Accept to New York State Anglers | 114 |
| <i>Cheng-Ping Wang and Chad P. Dawson</i> | |
| The Human Dimensions of the Wilderness Experience in the High Peaks Wilderness Area | 122 |
| <i>Peter Newman and Chad P. Dawson</i> | |
| Do Resource Managers Differ from the Public in Their Preferences for Management Alternatives? | 130 |
| <i>Donald F. Dennis</i> | |
| The Role of Ancillary Skills in Wildland Recreation Activity Participation | 136 |
| <i>Robert D. Bixler and Beverly Morris</i> | |
| The 1996 Fishing, Hunting, and Wildlife-Associated Recreation Survey--Results and Implications | 139 |
| <i>Allan Marsinko, Richard Aiken and John Dwyer</i> | |
| Relationship Between Visitor Knowledge of "Leave No Trace" Minimum-Impact Practices and | 142 |
| Attitudes Toward Selected Management Actions | |
| <i>John J. Confer, Jr., James D. Absher, Alan R. Graefe, and Andrea Hille</i> | |

Water Based Recreation and Management

| | |
|--|-----|
| Watercraft User Motivations, Perceptions of Problems, and Preferences for | |
| Management Actions: Comparisons Between Three Levels of Past Experience | 149 |
| <i>Stephen Bowes and Chad P. Dawson</i> | |
| Recreational Use Assessment of the Pere Marquette Scenic River and Management Implications | 156 |
| <i>Paul R. Johnson and Charles M. Nelson</i> | |
| Differences in Motivations for Different River Users and Potential Conflict | 160 |
| <i>William Perry and David K. Loomis</i> | |
| Water-Based Recreationists' Attitudes Regarding Customer Satisfaction: | |
| Differences Between Selected Market Segments | 166 |
| <i>Robert C. Burns, Alan R. Graefe, James D. Absher, and John Titre</i> | |

Recreation and Tourism Trends in the Northeast

| | |
|--|-----|
| Crowds at Special Events: An Examination of Perceived Crowding at a First Night® Event | 175 |
| <i>Hans Vogelsson and Deborah Kerstetter</i> | |
| Volume Segmentation of Selected Recreation Activities in the Northeastern United States: 1982-1996 | 177 |
| <i>Rodney B. Warnick, Ph.D.</i> | |
| Beliefs About New Hampshire, Maine and Vermont with Regard to Selected | |
| Tourism Opportunities and Amenities | 184 |
| <i>Alberto B. Manalo, Tracey Farrigan and Robert A. Robertson</i> | |
| 1997 General Public Recreation Survey for Onondaga County Parks | 188 |
| <i>Heidi Kortright and Miklos Gratzler</i> | |

Recreation Modeling

| | |
|--|-----|
| Influencing Human Behavior Through Persuasive Communication: Applications of | |
| the Elaboration Likelihood Model in Recreation Resource Management | 195 |
| <i>Kelly L. Finn and David K. Loomis</i> | |
| Recreation Participation and Scenic Value Assessments of Clearcuts | 199 |
| <i>James F. Palmer</i> | |
| Incorporating Broad-Based Values into Natural Resource Decision-making | |
| Conceptual and Measurement Challenges | 204 |
| <i>Ronald J. Glass, Thomas H. Stevens and Thomas A. More</i> | |

Demographics

| | |
|---|-----|
| Trends in Participation Rates for Wildlife-Associated Outdoor Recreation Activities by Gender and Race/Ethnicity..... | 213 |
| <i>John F. Dwyer, Allan Marsinko and Jonathan Fisher</i> | |
| Gender and Age Group Differences in Recreational Conflict and Tolerance among Adult Skiers and Snowboarders..... | 219 |
| <i>Brijesh Thapa and Alan R. Graefe</i> | |
| The Economic Impact of Conferences and Conventions in an Off-Season Resort Area -- a Case Study from the 1998 NERR Symposium..... | 227 |
| <i>Bruce E. Lord and William F. Elmendorf</i> | |

Roundtables, Management Sessions, and Poster Presentations

| | |
|--|-----|
| Response to the Adirondack Windstorm of July 15, 1998 by the New York State Department of Environmental Conservation | 233 |
| <i>Wayne G Blanchard</i> | |
| A Roundtable: The Student Internship-A Linkage to the Future of the Profession..... | 236 |
| <i>Steven W. Burr and Andy Holdnak</i> | |
| Spiritual Values: Can They be Incorporated Into Forest Management and Planning? | 239 |
| <i>Laura M. Fredrickson and William Kerr</i> | |
| Building Cardboard Boats, Teamwork, and a Sense of Community: An Innovative Outdoor Program | 246 |
| <i>Anita H. Magafas and Katharine A. Pawelko</i> | |
| Trailing Indiana: Indiana State and Local Government Trails Planning..... | 248 |
| <i>Eric A. Myers</i> | |
| Trailing Indiana: Mud, Manure and Money; a Dual Agency Effort in Dealing With Statewide Trail Issues | 251 |
| <i>Les Wadzinski</i> | |

| | |
|-----------------------|-----|
| Index of Authors..... | 253 |
|-----------------------|-----|



**Water Based Recreation
and Management**



WATERCRAFT USER MOTIVATIONS, PERCEPTIONS OF PROBLEMS, AND PREFERENCES FOR MANAGEMENT ACTIONS: COMPARISONS BETWEEN THREE LEVELS OF PAST EXPERIENCE

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Abstract: Recreational watercraft users on the Upper Delaware Scenic and Recreational River (UDSRR) were surveyed in 1996 about their characteristics and experiences. The results were analyzed using three experience level groups defined as beginner, intermediate, and advanced. These three experience groups were based on the number of previous trips on the UDSRR and on other rivers. Some significant differences were found between the three experience groups for some motivations, perceptions of problems, and preferences for management actions on the UDSRR. However, only a limited number of statistically significant differences were found between the three experience levels and not at a percentage that would require accommodation in river recreation management. The management implications for the UDSRR are discussed along with limitations on the application of these research results to other rivers.

Introduction

The Upper Delaware Scenic and Recreational River (UDSRR) was designated as part of the National Wild and Scenic River System in 1978 and is managed by the National Park Service (NPS). The UDSRR is located along the New York - Pennsylvania border and extends 73.4 miles from the confluence of the Upper Delaware's east and west branches in Hancock, New York downstream to Mill Rift, Pennsylvania. The UDSRR is a two hour drive from the greater New York metropolitan area and receives high levels of watercraft use. Estimated recreational use at NPS sites and on the UDSRR had risen to 496,397 visits by 1996 with 80% due to watercraft users (NPS unpublished report). Watercraft user studies on the UDSRR were conducted in 1979 (Dawson et al. 1981a and 1981b) as part of the National River Recreation Study (Knopf and Lime 1984) and were conducted intermittently through 1996 (Marion 1989, Pawelko 1996, Bowes 1997). A study conducted in 1996 (Bowes 1997) on the UDSRR characterized watercraft user motivations, perceptions of problems, and preferences for management actions. One of the research concerns that emerged was whether past

experience on the UDSRR or other rivers influenced user responses to these questions.

Some research has shown that the past experience can be correlated with hiker and watercraft user motivations, perceptions, behaviors, or satisfaction (Wellman et al. 1982, Schreyer and Roggenbuck 1978, Williams 1989, Watson et al. 1991, Kuentzel and McDonald 1992, Watson and Niccolucci 1992, Watson and Cronin 1994, Shafer and Hammitt 1995). A study on solitude at Grand Canyon reported that more experienced hikers stated a higher importance for solitude than first-time hikers (Stewart and Carpenter 1989). Another study compared the average number of years respondents had been boating on the Buffalo National River (Ditton et al. 1983) and found that floaters who reported feeling crowded averaged more years of experience and floated more times each year than the other groups.

Additionally, some studies have reported differences in user characteristics, motivations, and preferences for encounters based on a combination of previous experience at the study area and previous experience at other similar areas. A study in the Bob Marshall Wilderness Complex (Lucas 1986) reported that users had different characteristics and use patterns which indicated changing future user patterns and had important implications for managers.

Other studies have reported no relationship between past experience measures of users and other social interaction variables, such as a study in the Great Smoky Mountain National Park which reported that past experience measures of users were not related to their reaction to the number of users encountered (Patterson and Hammitt 1990).

The goal of this paper is to compare watercraft user motivations, perceptions of problems, and preferences for management actions based on past river floating experience. The three experience levels used to stratify UDSRR watercraft users were based on a combination of past experience on the UDSRR and past experience on other rivers.

Methods

The field research for the 1996 study (Bowes 1997) was carried out between June 1 and August 31. A total of 14 weekend days, and 6 weekdays were sampled systematically across the public and commercial access sites. Brief field interviews of non-motorized watercraft boaters were conducted to measure descriptive user characteristics such as group composition, watercraft type, origination and destination points on the river, and to ask watercraft users for their cooperation in a follow-up mail survey. The mail survey was similar to the questionnaire used in 1979. A modified Dillman technique was used (Salant and Dillman 1994) and up to three mail survey reminders were used to ensure a high response rate.

Results and Discussion

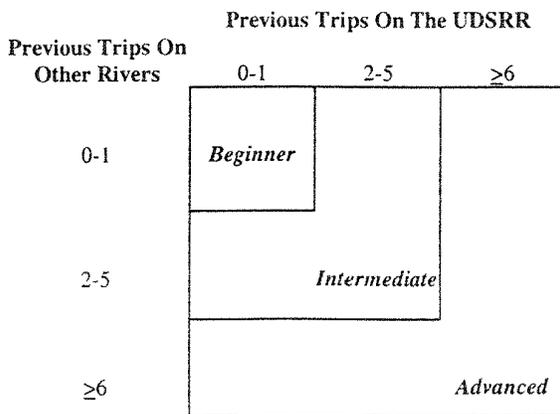
A total of 650 watercraft users were contacted in 1996 at public and commercial access sites and asked to participate

in a brief interview and a follow-up mail survey. During the interview process, 602 watercraft users gave their addresses and agreed to participate in the mail survey. Seventeen of the surveys sent out were undeliverable. Of the 585 surveys deliverable, 326 were returned for a 56% response rate (Bowes 1997).

To assess the possibility of non-respondent bias, a comparison of the respondents and non-respondents to the mail survey was made by testing for differences in four variables collected in the on-site interview. There was no statistically significant difference in the type of watercraft used on the UDSRR (Chi-square <1.3, 2 df, $p > 0.10$) nor whether it was a commercial or private trip on the UDSRR (Chi-square <0.5, 1 df, $p > 0.10$). There was a statistically significant difference in the previous number of times boating on the UDSRR for mail survey respondents versus non-respondents (3.2 vs. 2.7, t-test value = -2.2, 617 df, $p < 0.10$) and in the previous number of times boating on other rivers (2.7 vs. 2.0, t-test value = -3.1, 616 df, $p < 0.10$). These differences in the mean number of times boating on rivers were not large but indicate that those with more experience were more likely to respond to the mail survey.

The following analysis is based on the concept that the level of experience of the watercraft users is related to their watercraft user motivations, perceptions of problems, and preferences for management actions. The three experience levels used to stratify UDSRR watercraft users were based on a combination of past experience on the UDSRR and past experience on other rivers. The first group was called 'beginners' and included the respondents that had never been boating before or had only been once before (22% of respondents). The second group was called 'intermediate' and included the respondents that had been on two to five previous trips (33% of respondents). The third group was called 'advanced' and included the respondents that reported 6 or more previous trips (45% of respondents).

Figure 1. The past experience levels of watercraft users on the Upper Delaware Scenic and Recreational River in the summer of 1996.



Overall, the percentage of watercraft users paddling rafts and canoes is nearly equal (48% and 47%) on the UDSRR in 1996 (table 1). The percentage of rafting watercraft users significantly decreased as experience increased across the three experience levels; however, the percentage of canoeing and kayaking watercraft users increased as experience increased (Chi-square >26.6, 4 df, $p < 0.10$).

The percentage of watercraft users paddling rented watercraft was 89% while 11% reported using privately owned watercraft on the UDSRR in 1996 (table 2). However, the percentage of watercraft users paddling rented watercraft significantly decreased across the three experience levels while the percentage of watercraft users paddling privately owned watercraft increased (Chi-square >32.6, 2 df, $p < 0.10$).

The percentage of watercraft users on day trips was 65% in 1996 while 35% reported staying overnight along the UDSRR (table 3). The percentage of watercraft users on day trips or overnight trips was not significantly different across the three experience levels (Chi-square <0.9, 2 df, $p > 0.10$).

Watercraft users were asked to indicate their agreement or disagreement with 29 motivational statements for their trips on the UDSRR in 1996. Watercraft users were asked to rate their response to the motivational statements using five response categories: 2 = strongly agree, 1 = agree, 0 = neutral, -1 = disagree, and -2 = strongly disagree. The rating of these 29 motivational statements was very similar for all three experience categories of watercraft users; however, the ratings were so widely spread across the five response categories, the statistical analysis was based on two combined categories: agree or strongly agree versus neutral, disagree, and strongly disagree (table 4). Statistically significant differences between the three experience levels were reported for seven statements (Chi-square >5.4, 2 df, $p < 0.10$) but not at a level that would require differences in river recreation management. The percentage of agree or strongly agree responses tended to increase with boating experience levels for six of the seven statistically significant motivational statements while only one decreased in percentage (to experience new things).

Watercraft users were asked to indicate their perception about 30 potential problems for their trips on the UDSRR in 1996. The rating of 17 of these potential problem statements was similar for all three experience categories of watercraft users using two response categories: no problem or slight to serious problem (table 5). Statistically significant differences between the three experience levels were reported for 13 potential problems statements (Chi-square >5.6, 2 df, $p < 0.10$). The percentage of slight to serious problem responses tended to increase with boating experience levels for 12 of the 13 statistically significant potential problem statements while only one decreased in percentage (insufficient tourism information). The responses to these 12 statements does not suggest the need for additional management consideration even though a higher percentage of the advanced past experience group agreed with the 12 potential problem statements than did the beginner group.

Table 1. Type of watercraft used on the Upper Delaware Scenic and Recreational River in 1996 by level of past experience.

| Type of Watercraft Used ^a | Beginner | Intermediate | Advanced | Total |
|--------------------------------------|----------|--------------|----------|-------|
| | Percent | | | |
| Raft | 60 | 50 | 38 | 48 |
| Canoe | 39 | 43 | 56 | 47 |
| Kayak and other | 1 | 7 | 6 | 5 |

^a Significant difference between the three experience levels: Chi-square >26.6, 4 df, p< 0.10.

Table 2. Type of watercraft ownership on the Upper Delaware Scenic and Recreational River in 1996 by level of past experience.

| Type of Watercraft Ownership ^a | Beginner | Intermediate | Advanced | Total |
|---|----------|--------------|----------|-------|
| | Percent | | | |
| Rented | 96 | 94 | 80 | 89 |
| Privately owned | 4 | 6 | 20 | 11 |

^a Significant difference between the three experience levels: Chi-square >32.6, 2 df, p< 0.10.

Table 3. Type of trip duration along the Upper Delaware Scenic and Recreational River in 1996 by level of past experience.

| Trip Duration ^a | Beginner | Intermediate | Advanced | Total |
|----------------------------|----------|--------------|----------|-------|
| | Percent | | | |
| Day trip | 70 | 67 | 64 | 65 |
| Over night trip | 30 | 33 | 36 | 35 |

^a No significant difference between the three experience levels: Chi-square <0.9, 2 df, p> 0.10.

Table 4. Percent of respondents who agreed or strongly agreed with a motivation statement for boating on the Upper Delaware Scenic and Recreational River in 1996 by level of past experience.

| Motivations for Boating ^a | Beginner | Intermediate | Advanced | Total |
|--|----------|--------------|----------|-------|
| | Percent | | | |
| <u>Significant Differences Between Groups</u> | | | | |
| To be close to nature ^b | 80 | 87 | 92 | 88 |
| To get away from daily life ^b | 80 | 91 | 89 | 88 |
| To experience new things ^b | 85 | 73 | 61 | 70 |
| To see historical sites ^b | 19 | 20 | 32 | 25 |
| To go fishing ^b | 12 | 19 | 35 | 24 |
| To be alone ^b | 6 | 15 | 26 | 18 |
| To use boating equipment ^b | 12 | 11 | 24 | 17 |
| <u>No Significant Differences Between Groups</u> | | | | |
| To view scenery | 96 | 96 | 97 | 97 |
| To change routines | 85 | 92 | 92 | 90 |
| To run rapids | 86 | 85 | 87 | 86 |
| To be with friends | 87 | 85 | 87 | 86 |
| To experience peace and calm | 73 | 83 | 84 | 81 |
| To experience excitement | 79 | 83 | 79 | 80 |
| To release anxiety | 77 | 84 | 77 | 79 |
| To exercise | 69 | 81 | 76 | 76 |
| To mentally rest | 70 | 71 | 75 | 72 |
| To be part of a group | 69 | 64 | 64 | 65 |
| To get away from crowds | 57 | 58 | 64 | 60 |
| To spend time with family | 46 | 61 | 61 | 58 |
| To be with similar people | 51 | 55 | 48 | 51 |
| To reflect | 41 | 53 | 53 | 50 |
| To test abilities | 50 | 42 | 47 | 46 |
| To learn about nature | 39 | 43 | 50 | 45 |
| To go camping | 31 | 39 | 42 | 39 |
| To get away from people | 34 | 37 | 40 | 38 |
| To take chances | 40 | 34 | 30 | 34 |
| To experience self worth | 19 | 26 | 31 | 27 |
| To meet people | 18 | 28 | 17 | 21 |
| To show others my skills | 26 | 19 | 17 | 19 |

^a Two categories were used in the statistical test: agree or strongly agree versus neutral, disagree, and strongly disagree.

^b Significant difference between the three experience levels: Chi-square >5.4, 2 df, p< 0.10.

Table 5. Percent of respondents who perceived a problem while boating on the Upper Delaware Scenic and Recreational River in 1996 by level of past experience.

| Perceived Problem ^a | Beginner | Intermediate | Advanced | Total |
|--|----------|--------------|----------|-------|
| | Percent | | | |
| <u>Significant Differences Between Groups</u> | | | | |
| Litter on the river banks ^b | 43 | 57 | 66 | 58 |
| Litter in the river ^b | 41 | 52 | 65 | 55 |
| Insufficient tourism information ^b | 62 | 54 | 42 | 51 |
| People being inconsiderate ^b | 28 | 32 | 49 | 39 |
| Unskilled people on river ^b | 23 | 30 | 45 | 35 |
| Not enough campsites ^b | 29 | 24 | 45 | 34 |
| Poor quality campsites ^b | 18 | 25 | 35 | 28 |
| Campsites occupied ^b | 15 | 17 | 33 | 24 |
| Vandalism ^b | 13 | 17 | 26 | 20 |
| Too many rules and regulations ^b | 12 | 18 | 26 | 20 |
| Too much law enforcement ^b | 7 | 10 | 18 | 13 |
| Too many signs on the river ^b | 7 | 7 | 16 | 11 |
| Water pollution ^b | 23 | 38 | 41 | 36 |
| <u>No Significant Differences Between Groups</u> | | | | |
| Inadequate toilet facilities on the river | 65 | 58 | 67 | 63 |
| Inadequate toilet facilities at access pts. | 54 | 57 | 57 | 57 |
| Inadequate brochures/map about river | 45 | 47 | 55 | 50 |
| Too few garbage cans | 48 | 51 | 49 | 49 |
| Too many people on the river | 41 | 41 | 52 | 46 |
| Navigation problems due to low water | 44 | 41 | 38 | 40 |
| Erosion of stream banks | 41 | 31 | 38 | 37 |
| Inadequate river information | 34 | 36 | 39 | 37 |
| Campsites not identified | 25 | 26 | 36 | 30 |
| Obstructions in the river | 35 | 24 | 31 | 29 |
| Too many commercial establishments | 23 | 20 | 27 | 24 |
| Not enough law enforcement | 21 | 25 | 21 | 22 |
| Too few rules and regulations | 10 | 19 | 19 | 17 |
| People fishing | 17 | 12 | 13 | 14 |
| High water | 3 | 11 | 11 | 10 |
| Conflicts with group | 6 | 13 | 7 | 9 |
| Damage or loss of personal property | 4 | 6 | 7 | 6 |

^a Two response categories: no problem versus slight to serious problem.

^b Significant difference between the three experience levels: Chi-square >5.6, 2 df, p < 0.10.

Watercraft users were asked to indicate their agreement or disagreement with 20 potential management actions for the UDSRR in 1996. Watercraft users were asked to rate their response to the potential management actions using five response categories: 2 = strongly agree, 1 = agree, 0 = neutral, -1 = disagree, and -2 = strongly disagree. The rating of these 20 potential management actions was very similar for all three experience categories of watercraft users; however, the ratings were so widely spread across the five response categories, the statistical analysis was based on two combined categories: agree or strongly agree versus neutral, disagree, and strongly disagree (table 6). Statistically significant differences between the three experience levels were reported for six potential management actions (Chi-square >5.6, 2 df, p < 0.10). The percentage of agree or strongly agree responses tended to decrease with boating experience levels for four of the six statistically significant potential management actions. Two of the significantly different potential management actions about the provision of campsites had the highest percentage for advanced users and lowest percentage for intermediate users, while the beginner group of users ranked in between

the other two groups. Generally, the differences in percentages between the groups were not at a level that would require differences in river recreation management for any potential management action.

The expectations of watercraft users prior to their trip on the UDSRR were generally the same as what they experienced based on questions with response categories of: far fewer than expected, fewer than expected, same as expected, more than expected, and far more than expected. Canoes and kayaks were seen as often as expected by most users (52%) and rafts were seen as often as expected by many users (48%) but the percent differences between the three experience groups were small and were not statistically significant (Chi-square <5.8, 8 df, p > 0.10). Also, the number of watercraft seen at access points was about what was expected by users at put-ins (65%), take-outs (63%), and attractions (61%); furthermore, the percent differences between the three experience groups were small and were not statistically significant (Chi-square <5.1, 8 df, p > 0.10).

Table 6. Percent of respondents who supported or strongly supported a potential management action on the Upper Delaware Scenic and Recreational River in 1996 by level of past experience.

| Potential Management Action ^a | Beginner | Intermediate | Advanced | Total |
|--|----------|--------------|----------|-------|
| | Percent | | | |
| <u>Significant Differences Between Groups</u> | | | | |
| Develop short hiking trails along river ^b | 88 | 80 | 74 | 79 |
| Construct a new visitor center ^b | 80 | 64 | 53 | 63 |
| Provide campsites at access points ^b | 55 | 44 | 60 | 53 |
| Provide more campsites along river ^b | 49 | 38 | 58 | 49 |
| Provide more patrols for enforcement ^b | 57 | 39 | 36 | 42 |
| Assign group launch times ^b | 48 | 32 | 34 | 36 |
| <u>No Significant Differences Between Groups</u> | | | | |
| Require carry out of trash | 85 | 88 | 90 | 88 |
| Provide river distance markers | 72 | 68 | 67 | 69 |
| Allow campfires at designated locations | 61 | 71 | 66 | 67 |
| Improve existing access points | 68 | 61 | 65 | 64 |
| Post warning signs for hazards | 68 | 54 | 57 | 59 |
| Improve public access points | 56 | 48 | 57 | 54 |
| Provide more parking access points | 41 | 43 | 52 | 47 |
| Provide more public access points | 51 | 41 | 46 | 46 |
| Require first aid equipment | 49 | 34 | 43 | 41 |
| More enforcement of safety rules | 41 | 30 | 36 | 35 |
| Limit group size | 29 | 22 | 29 | 26 |
| Limit number of boaters | 33 | 23 | 23 | 25 |
| Prohibit campfires | 18 | 7 | 12 | 12 |
| Prohibit camping along the river | 10 | 9 | 7 | 8 |

^a Two categories were used in the statistical test: agree or strongly agree versus neutral, disagree, and strongly disagree.

^b Significant difference between the three experience levels: Chi-square >5.6, 2 df, p < 0.10

The feelings of watercraft users about the number of other watercraft seen on their UDSRR trip were generally neutral based on questions with response categories of: would like to see fewer watercraft, neutral about number of watercraft seen, and would like to see more watercraft. Users most often expressed neutral responses to seeing canoes and kayaks (70%) and rafts (63%) and the percent differences between the three experience groups were small and were not statistically significant (Chi-square <7.6, 4 df, p > 0.10). Also, the feelings of watercraft users about the number of watercraft seen at access points were generally neutral for put-ins (83%), take-outs (84%), and attractions (74%); furthermore, the percent differences between the three

experience groups were small and were not statistically significant (Chi-square <4.8, 4 df, p > 0.10).

Finally, watercraft users were asked to indicate their overall perception of crowding, on a six point scale, for their experiences on the UDSRR in 1996. Overall, 23% of watercraft users reported that it was not crowded and only 6% reported that it was very crowded (table 7). The differences between the three experience groups were small and were not statistically significant (Chi-square <8.7, 10 df, p > 0.10).

Table 7. Perceptions of crowding on the Upper Delaware Scenic and Recreational River in 1996 by level of past experience.

| Perceptions of Crowding ^a | Beginner | Intermediate | Advanced | Total |
|--------------------------------------|----------|--------------|----------|-------|
| | Percent | | | |
| 1 Not at all crowded | 23 | 22 | 24 | 23 |
| 2 | 18 | 28 | 28 | 26 |
| 3 | 23 | 19 | 17 | 19 |
| 4 | 18 | 12 | 11 | 13 |
| 5 | 16 | 11 | 14 | 13 |
| 6 Extremely crowded | 2 | 8 | 6 | 6 |

^a No significant difference between the three experience levels: Chi-square <8.7, 10 df, p > 0.10.

Discussion

Overall, this study has marginally supported the concept that past experience is associated with watercraft user characteristics, motivations, perceptions, and preferences. The following variables had statistically significant

differences across the three levels of past experience but it is questionable whether they have management significance (i.e., relatively small differences in reported percentages may be statistically significant but it does not follow that there is a need for changes in management):

- use of privately-owned canoes and kayaks increased with past experience levels for UDSRR watercraft users;
- six of 29 motivational statements about going to the UDSRR had an increasing percentage of support with increasing past experience, however, one motivational statement had a decreasing percentage with past experience (to experience new things);
- twelve of 30 potential problem statements about the UDSRR had an increasing percentage of support with increasing past experience, however, one potential problem statement had a decreasing percentage with past experience (insufficient information); and
- four of 20 potential management actions about the UDSRR had a decreasing percentage of support with increasing past experience, however, two potential management actions related to the provision of campsites had a mixed association with past experience.

Unlike some other reported river recreation studies on past experience (e.g., Ditton et al. 1983), UDSRR user responses did not have statistically significant differences for 12 crowding variables across three different levels of past experience:

- one variable about whether users stayed overnight along the UDSRR or not;
- five variables about the expectations of users for the number of other watercraft compared to what they experienced on the UDSRR;
- five variables about the feelings of users for the number of other watercraft they experienced on the UDSRR; and
- one variable about the user perceptions of whether they felt crowded or not on the UDSRR.

In conclusion, this study was not originally designed to test for comparisons of user characteristics and their past experience so several cautions are noted here about generalizing these results to other rivers. First, greater variation may be found if more specific areas and time frames were utilized since the UDSRR is a 73.4 mile long river segment with different use patterns across its length (e.g., greater use in the southern portion and less use towards Hancock, NY) and between seasons and weekdays versus weekend days (Bowes 1997). Second, a longitudinal study would have better been able to measure such factors as temporal and spatial displacement, user expectations and norms, and information dissemination impacts on user decision making. Third, since many UDSRR users come from the New York-New Jersey metropolitan area (Bowes 1997), they may have a greater tolerance for crowding than river users in less populated areas and may have information about current use patterns. Fourth, there is some response bias towards more experienced users responding to the mail survey but its affect on the study results is not known.

This study provided some statistical support for the concept that past experience is associated with watercraft user characteristics, motivations, perceptions, and preferences but not feelings about crowding. The management

significance of these results is relatively small and, based on the relative differences in percentages between the three levels of past experience, there is no apparent need for changes in river recreation management to accommodate users with different levels of past experience. The study does help river recreation researchers and managers to better understand watercraft users and better appreciate the diversity of motivations, perceptions, preferences, feelings about other users, and preferences for management.

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RECREATIONAL USE ASSESSMENT OF THE PERE MARQUETTE SCENIC RIVER AND MANAGEMENT IMPLICATIONS

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Abstract: In updating the Forest Service management plan for Michigan's Pere Marquette Scenic River corridor, recreational use from public access sites in the 48 mile long corridor during fall 1996 and spring and summer 1997 was assessed at 760 thousand visitor hours. Fishing was the primary use during spring and fall, and fishing and canoeing in the summer. While visitor satisfaction with corridor experiences was high, concerns were expressed about crowding, littering, visitor behavior, convenience of access and regulation.

Introduction

The Pere Marquette River in Michigan's Manistee National Forest was statutorily designated as a National Scenic River in a 48 mile stretch on the main stream from Baldwin to Custer in 1978. The manager responsible for implementation of this status is the US Forest Service (USFS). To promote appropriate stewardship of the resource, the USFS drafted an initial corridor management plan, which was approved in 1983. Key stewardship objectives included maintaining the largely undeveloped character of the shoreline and providing recreational opportunities in keeping with scenic status. The plan was subsequently updated and the amended plan was approved in 1990.

In the 1990 plan, six major steps were enumerated and subsequently taken to meet the above mentioned management objectives:

1. Management activities on USFS lands visible from the river were required to meet retention or partial retention visual quality objectives
2. Watercraft launching from USFS access points was regulated
3. USFS access site parking was moved back to 100 or more feet from the river
4. USFS access points were hardened to protect eroding sites by restoring vegetation or providing riprap, gravel or stairways at sites not suitable for vegetation

5. Some USFS access points were changed to walk-in sites where parking was 1/4 mile or more from the river
6. Camping on USFS land was limited to developed campgrounds or permitted dispersed sites.

The corridor presents significant management challenges in terms of management authority, riparian ownership, public access and recreational activities, especially as they vary by season. The USFS has authority as the appointed manager of the federal Scenic designation. They own the most public land within the corridor and provide developed corridor access sites and four developed campgrounds within the corridor. However, the river is also designated under Michigan's Natural Rivers Act. This provides for zoning that restricts private development near the water, either done by local units of government or by the State of Michigan, through the Michigan Department of Natural Resources (DNR). Further, the fisheries resource in the river is managed by the DNR. Examples of this authority include fish stocking (primarily steelheads and chinook salmon) and restrictions on fishing equipment, such as a "flies only" section on the upper 40% of the Scenic river section. The road commissions of two counties also have authority over county roads that cross, are adjacent to or dead end at the river. Finally, over 100 riparians own property within the corridor. These properties include primary homes, second homes, vacant land, resorts and non-profit associations.

Designated public access is provided at 13 USFS sites and 5 DNR sites. In addition, two privately owned commercial canoe liveries each provide an access point for their patrons that is often used by other members of the public. Additional access for selected persons is provided by the 111 riparian owners who own 65% of the shoreline. This including some resorts and associations, that serve numerous clients and members. Finally, county roads at bridges and road ends also provide non-designated access points.

Recreational activities include a variety of land and water based activities. However, water based activities are the focus for the most use and conflict. These include fishing for stream trout (primarily brown trout) and anadromous chinook salmon (fall) and steelhead trout (primarily spring, but some fall and winter). Fishing is done by wading and drifting. A portion of drift anglers use commercial boats and guides, while others use their own craft and knowledge of the river. Two commercial canoe liveries rent canoes, in addition to private canoes. Watercraft launching (canoes and drift boats) is regulated at USFS access points, but not at DNR sites. Other in-water uses include tubing and swimming during warm weather. Land based activities include hunting, camping, mushroom and berry picking and a variety of non-motorized trail uses. Nature observation and photography are both land and water based.

Since 1996, the Forest Service has been engaged in a further corridor management plan update. To do this, they

contracted with the Department of Park, Recreation and Tourism Resources at Michigan State University to assess the amount and type of recreational use generated at designated public access points in the corridor and to scope issues related to corridor management. This report provides data for corridor use through public access points for fall 1996 (September 15 - December 15), spring 1997 (February 15 - May 15) and summer 1997 (May 16 - September 15). It also examines visitor satisfaction with corridor experiences and discusses management implications of the issues identified by visitors.

Methods

Use was estimated in a two step process. The first step was to systematically count vehicles at the designated public access locations on the river within the Scenic corridor. Of the 20 sites, 18 were sampled during fall, spring and summer. Of the remaining two, one canoe livery was sampled only in the summer and the other only in fall and summer as they were closed at other times.

After the vehicles were counted at an access site, a business reply postcard questionnaire was placed on the windshield of each vehicle or given to the driver if he/she was present. The researcher would then drive to the next access point and repeat the process. This was done at different times of the day at each site to ensure the widest range of users were sampled.

The card elicited information about the number of people who arrived in the vehicle, their recreational use of the site, their length of stay and their experiences. The questionnaire was patterned after similar studies done by the researchers to estimate recreational use of various state and national forest areas and recreation facilities (Nelson and Lynch 1994, Nelson et al. 1994). It was designed by the researchers and reviewed by the USFS and various stakeholders. From the data provided by survey results and the car counts, key characteristics of public access point use and users can be assessed, including an estimate of user hours.

In this study, caution is taken to counteract bias related to length of stay. For example, if one vehicle is parked for 12 hours and another for 1 hour, there is a 12 times greater chance of sampling the person parked for 12 hours. Without weighting to control for length of stay bias, a false impression could be provided that most users stay for a long time. Hence, each case or response is weighted by the reciprocal of the length of stay (e.g. 1/1 and 1/12 in the example).

During each season, four sample days were chosen per week. Two were on weekend days (Saturday and Sunday) and two on weekdays (Monday - Friday). The river was divided into an upper and lower half. The upper sites were sampled one weekend day and one weekday and the lower sites on the other two. There were only very rare exceptions to this procedure. These were due to illness and other staffing problems for the survey administrator.

When considered by fall, spring and summer, the upper sites were respectively sampled on 52%, 46% and 44% of the weekend days and 20%, 20% and 18% of the weekdays. For fall, spring and summer the lower sites were respectively sampled 48%, 46% and 47% of weekend days and 20%, 19% and 20% of the weekdays.

Estimated Corridor Use

Response rates to questionnaires left on vehicles was relatively low during each season. For fall, spring and summer rates were respectively 26%, 23% and 16%. Three factors are assessed to be responsible. First, there was little personal contact with visitors. Second, there was no opportunity for followup with non-respondents. Third, many visitors appeared to be repeat visitors as, in many instances, the same vehicle was counted on different days. Hence, while the occupant may have completed the first questionnaire they received, they did not complete subsequent ones, even though they were requested to in the survey instrument.

Estimated user hours in the corridor are computed by extrapolating the vehicle tallies by the mean party size, length of stay and likelihood of being sampled during each season as influenced by the length of stay during the sample day and the proportion of weekend days and week days sampled. Use estimates were greatest during summer (Table 1). As an example of how the estimates are derived, for summer 1997, the estimate for weekend day use at sites 1 - 11 (upper river) is calculated: Multiply the mean party size (2.78) by the mean hours of stay (4.39). Multiply the product of this by the weekend vehicle count on sites 1-11 (1,425), the reciprocal of the proportion of the sample day the mean respondent was present (15hours/4.39hours=3.42), the reciprocal of the proportion of weekdays sampled (36/16=2.25). This equals a weekend user hours estimate of 133,824 hours for sites 1 - 11 during summer 1997. When the user hours across weekends and week days for all segments are summed, this can then be divided by the mean party size times the mean hours of stay ($2.78 * 4.39 = 12.2042$) to obtain the estimate of total vehicles parked during the summer.

Total use of the corridor during the sample seasons is estimated to be 760,640 visitor hours with 46,875 vehicles parked at public access points during the seasons. Weekend use accounted for 50.9% of the user hours and week day use for 49.1%. By season however, weekday users accounted for the majority of user hours in fall (55.5%) and spring (54.3%) and a minority in summer (42.3%). Hence, peaking of use on weekends was greatest during the summer. On a per day basis in the corridor, weekend user hours were 4,293 in fall, 2,475 in spring and 5,753 in summer. On a per day basis, week day user hours by season were 2,228 in fall, 1,196 in the spring and 1,746 during summer.

The most frequent main activity reason for corridor access during fall and spring was fishing (Table 2). During

summer, angling and canoeing/tubing were the main reason for similar proportions of visitors. Land based activities such as camping, hiking, hunting, etc. along with land or water based activities such as nature observation and

photography (classified under other) were common activities. However, they were seldom cited as the main reason for corridor access.

Table 1. Derivation of Pere Marquette Scenic River corridor use from public access sites during fall 1996, spring 1997 and summer 1997.

| Use Estimate Category | Fall | Spring | Summer |
|--|---------|---------|---------|
| Mean party size | 2.18 | 2.06 | 2.78 |
| Mean hours stay | 5.20 | 4.51 | 4.39 |
| Vehicle count weekend days sites 1-11 | 1,099 | 590 | 1,425 |
| Vehicle count weekend days sites 12-29 | 689 | 373 | 829 |
| Vehicle count week day sites 1-11 | 573 | 284 | 404 |
| Vehicle count week day sites 12-29 | 314 | 203 | 282 |
| Reciprocal of | | | |
| Proportion of sample day present | 2.88 | 3.32 | 3.42 |
| Proportion of weekend days sampled sites 1-11 | 1.93 | 2.17 | 2.25 |
| Proportion of weekend days sampled sites 12-29 | 2.08 | 2.17 | 2.12 |
| Proportion of week days sampled sites 1-11 | 5.00 | 4.92 | 5.44 |
| Proportion of week days sampled sites 12-29 | 5.00 | 5.33 | 5.12 |
| Totals | | | |
| Weekend user hour sites 1-11 | 69,198 | 39,432 | 133,824 |
| Weekend user hour sites 12-29 | 46,718 | 24,929 | 73,285 |
| Week day user hour sites 1-11 | 93,535 | 43,131 | 91,697 |
| Week day user hour sites 12-29 | 51,257 | 33,394 | 60,240 |
| Estimated user hours | 260,708 | 140,886 | 359,046 |
| Vehicle estimate | 22,990 | 15,165 | 29,420 |

Table 2. Main activity reason for visit at designated Pere Marquette Scenic River corridor public access sites during fall 1996, spring 1997 and summer 1997.

| Main Activity | Percent | | |
|--|---------|--------|--------|
| | Fall | Spring | Summer |
| Wading / shore fishing | 60.8 | 68.3 | 37.0 |
| Drift fishing (commercial or private) | 13.0 | 14.5 | 6.6 |
| Combination of fishing methods | 6.1 | 6.0 | 0.9 |
| Rental or private canoeing / tubing / swimming | 7.6 | 1.4 | 44.1 |
| All other activities | 12.5 | 9.8 | 11.4 |

Satisfaction with the Experience

During all seasons, most respondents expressed great satisfaction with their corridor experience. On a scale of 1 - 9, with 1 being highly dissatisfied and 9 being highly satisfied, the mean response in fall was 7.3, with a standard error of .08. It was similar during spring (7.4, SE=.10) and summer (7.8, SE=.07). The most common response during each season (fall 39.7%, spring 40.2% and summer 43.2%) was the highest possible rating, 9. Very few expressed dissatisfaction with 9.3% rating the experience lower than 5 in the fall, 6.2% in the spring and 3.4% during the summer.

Responding to an open-ended question about the one most important reason for their rating, more positive than negative reasons were cited. During fall, 61.6% of

respondents cited positive reasons. The three most common were good fishing (24.5% of all positive and negative reasons), scenic beauty (10.2%) and convenient access (8.4%). During that same season, 24.3% cited reasons of a negative tone with crowded conditions (5.8%), litter (3.2%) and poor fishing (3.2%) and too many restrictions/enforcement (2.6%) and poor maintenance/management (2.6%) most common. A total of 14.1% provided no rationale or a nonsensical response.

During spring, the situation was similar to fall, with 57.9% providing a positive rationale. The three most common positive reasons were good fishing (17.4%), convenient access (11.4%) and scenic beauty (11.2%). Of the 22.4% who provided negative reasons, poor fishing (7.1%),

crowding (6.8%) and lack of good access (2.7%) were the most common. A total of 19.7% provided no rationale or a nonsensical response.

The rationale cited in the summer differed from spring and fall. During this season, 67.0% cited a positive rationale. The three most common were good water/corridor quality (15.1%), scenic beauty (13.5%), and well maintained/managed (8.8%). A total of 19.1% of the respondents provided negative rationale. The three most frequent were poor fishing (5.8%), crowded (2.4%), and poor behavior by other recreationists (2.3%). A total of 13.9% provided no rationale or a nonsensical response.

Management Implications

Positive management implications for the USFS from the satisfaction ratings focus on their role in maintaining a quality environment. In particular, USFS managers have emphasized protection of water quality and scenic resources by setting back access sites from the water's edge and using retention and partial retention visual quality standards for all management activities on USFS lands. The USFS was also instrumental in providing convenient access and in maintaining their access sites and campgrounds, including through recent site hardening and facility renovation that provided upgraded facilities, reduced maintenance time and improved water quality through erosion control.

Negative management implications relate to crowding, litter, behavior by others, excessive management control and complaints about lack of "good" access. Crowding is influenced by the regulating the access of certain recreationists (watercraft users) and lack of regulation of others (anglers). It is also exacerbated by certain angling methods such as drift fishing where two anglers in a drift boat fishing parallel with the river are in conflict with up to 20 shore/wading anglers fishing horizontal to the river over the same length of stream.

Litter and concerns about the behavior of others relate to a lack of law enforcement presence by the USFS in the corridor. In addition, many respondents also cited alcohol use and abuse when describing concerns about litter and behavior. There are currently no restrictions on alcohol possession, by either the USFS, the State of Michigan or commercial operators such as canoe liveries and drift boat guides. However, in Michigan law, it is illegal to operate a vessel (which includes canoes) under the influence of alcohol, just as it is an automobile. Hence, for those officers empowered to enforce state law, it would be possible to enforce alcohol statutes against legally intoxicated persons paddling a canoe. However, most USFS personnel are not empowered to do this.

Others see the corridor as already over regulated and advocate less management presence and enforcement. This view may represent those who have been involved in an enforcement action or resent a visible management presence in what otherwise may be a natural setting. Access concerns revolved around unplowed access points where deep snow did not allow anglers to easily access prime steelheading spots. This was due to above average late season snow and USFS concerns about maintaining the long term structural integrity of unpaved roads.

Challenging management implications relate to fishing for anadromous species. Runs of chinook salmon and steelhead are influenced by many factors outside of the control of the USFS. Stocking levels, survival rates in Lake Michigan, harvest by anglers in Lake Michigan and, to some extent, the weather, influence runs of these fish. Expectations for an outstanding fishery can be created and not met through no fault of the USFS. Conversely, stream trout (primarily brown trout) are more significantly influenced by in-stream water quality, food and cover. These factors can and have been positively influenced by USFS decisions to reduce erosion and provide in-stream habitat through the use of riprap and other in water stabilization materials.

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DIFFERENCES IN MOTIVATIONS FOR DIFFERENT RIVER USERS AND POTENTIAL CONFLICT

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Abstract - The Deerfield River is located in the northwest corner of Massachusetts. In the late spring, summer and early fall the Deerfield sees a high amount of recreational use. There are basically two different types of users on the Deerfield. There are rafters, both commercial and private, and hard boaters, consisting of kayaks and open and closed whitewater canoes. The two groups tend to differ on experience levels, commitment to the activity and amount of time and money dedicated to the activity. By its nature kayaking requires an initial investment in equipment and time just to begin participating. Rafting, on the other hand, can be done with a comparatively minimal amount of investment and instruction. Based on past research, it is expected that the two groups will differ greatly in their motivations for participating in the activities on the river. It is expected that this difference in motivations could be the basis for an asymmetrical conflict between the two groups. A study was conducted during the summer of 1997, by the University of Massachusetts. This survey was administered on site when the users were ending their day on the river. The survey is 8 pages long and contains 55 items relating to a number of different aspects of the recreational experience. In this paper, we will attempt to look at the difference in motivations for the two groups and at any conflict that may exist between the groups. Conflict is measured as perceptions of each group by the other group.

Introduction

The Deerfield River in northwestern Massachusetts has become very popular due to the high quality opportunities it provides for a variety of whitewater activities, such as kayaking and commercial rafting. Use of the River for these activities has increased dramatically since the late 1980s. The increase in use is primarily the result of reliable water levels on the River. New England Power Company operates a number of hydroelectric power generation stations along the River. In 1991, these dams came up for relicensing under the Federal Energy Regulatory Commission (FERC), and as part of the relicensing process, a reliable schedule of whitewater releases was established.

These releases have made commercial and private use of the River viable even during the hot, dry summer months.

The increase in use has led to a controversy during the past few years. Since use of the River had increased so dramatically, commercial rafting quotas were implemented in 1991, at the request of the commercial rafting companies. Commercial whitewater rafting use on the River was and remains limited by state regulations to a total of 320 passengers per-day. There is no similar quota for use by private kayakers. This quota of 320 passengers has been divided among the original four outfitters that applied for permits when the regulations went into place. Since the reliable water releases began, other commercial outfitters, in addition to the original four, have sought to gain access to the River by applying for permits. These outfitters have been denied permits to operate on the River. The basis for the denial has been that the existing quota of 320 customers that has been set in the regulations is being used and the state cannot justify taking spaces away from the existing outfitters to give to new outfitters. This has led to lawsuits from two rafting companies who claimed that more spaces should be added and that the number 320 is not appropriate (i.e., it is too low). This contention that the quota is too low is opposed by many of the current users of the River including a coalition of private users. Indeed, some of the private users contend that there may be too many commercial rafts on the River as it is. They claim the rafts pose a safety hazard to other users of the River.

The presence of these two groups (rafts and kayaks) on the River results in numerous interactions and potential conflicts taking place throughout the day. The groups interact at the put-ins as they walk down the hill to the River. This can be a stressful time as it takes time for rafting passengers to walk down a steep incline and climb into the rafts. Kayakers that use the put-in more regularly than individual raft customers can become impatient and disgruntled with the length of the wait to get on the River. The way in which the two groups use the River is very different as well. Kayaks are very maneuverable and can spend much more time going through the rapids. They tend to "play" in the rapids and "surf" waves and holes on their way down through the rapid. At certain spots large groups of kayaks gather to show their skills on surfing waves that are especially well formed. Rafts on the other hand are much less maneuverable. They go through each rapid fairly quickly, then stop to regroup at the bottom of the rapid. Rafts generally come through the rapids in groups of 5 to 12 rafts. Usually, kayakers will pull over to the side of the River and let the rafts pass before returning to the main current to continue playing. Sometimes if there is enough space between individual rafts, kayakers will pull out to play or move downstream during this break in the rafts. On occasion this will cause a conflict if the raft comes close to or even hits a kayak. Finally, the take out area, relatively small in size, becomes very congested as a large number of people try to load up their gear to head home. Raft companies require large trailers and vans for hauling rafts and gear. This can cause a conflict as users try to maneuver around each other and become impatient. These conflicts have led to hard feelings between some of the

users of the River. It had been suggested on a number of occasions that a study was necessary to determine the level of safety on the River considering the current use levels.

As a part of one lawsuit, the Massachusetts State Department of Environmental Law Enforcement, the agency charged with overseeing the Deerfield River, was ordered by the courts to have such a study conducted during the summer of 1997. The specific goals of the study were to determine the appropriateness of the 320 passenger quota for commercial rafting companies and to determine if more spaces could be added. The authority of the state to regulate the River is based on the issue of public safety. Therefore, the primary issue for the state was how safe the number 320 is and how the addition of more rafts to carry additional passengers would affect the level of safety on the River. There are, however, a whole host of other issues that affect use on the Deerfield River. The ideas of conflict, crowding, safety, and carrying capacity are all interrelated issues that affect use of the River and the dynamics between the groups. The study as conducted examined these issues on the Deerfield River, and sought to better understand current and increased use levels, conflicts and potential crowding.

The Deerfield River

The most heavily used sections of the River are separated into two sections by a 60-foot earthen hydroelectric dam (the Fife Brook Dam). The Fife Brook, or Zoar Gap, section of the River located below the Fife Brook Dam, is a stretch of easy whitewater with an intermediate (Class III) rapid easily accessible from the road. There are a number of different put-in and take-out spots on this stretch of River allowing for a number of different opportunities in terms of the length of the day on the River and times of day when the River level is most likely to be high. This section is appropriate for beginning kayakers, open canoeists, and has recently seen a large increase in the use of inner tubes (tubers) on the River. This section of the River has guaranteed water releases from the hydroelectric dam on 105 days from April through October.

The other section of the River is the Monroe Bridge stretch, or Dryway. Starting below the #5 station dam in Monroe and ending above the Fife Brook Dam, this section is an advanced intermediate run consisting of exciting rapids (Class III-IV). There is limited access on this stretch of River, since although the River is near the road it is in a fairly steep gorge. There are two potential put-ins to start the trip. Most users choose the first put-in next to the dam. A few users utilize a put-in that starts after the first two rapids. Users of this stretch of River include commercial rafts, private kayakers and a few private rafts. This section has guaranteed water releases over the #5 Station Dam on 32 days between May and October.

Literature Review

Motivations

There has been an increasing amount of attention paid to why users participate in certain activities. The motivations behind why recreationists choose their activities are of interest to managers and scientists. Understanding the

motivations behind a user's choice to participate can lead to a better understanding of the experience the user is seeking. Studies indicate that motivations for outdoor recreation are diverse and related to the attitudes, preferences and expectations of users (Manning, 1986). Motivations have been shown to have a large effect on a visitor's satisfaction with his or her recreational experience. It has been shown that motivations not directly linked to an activity can have a large effect on satisfaction and feelings of conflict (Buchanan, 1983). Often visitors to the same area will have very different motivations for being there, and that experiences sought are often very different and sometimes incompatible across different user groups.

In the Deerfield River situation, the two main groups are very different in their activities; kayaking and rafting are different methods of using the same resource and tend to attract different types of people. The two groups of users differ not only in their specific activity, but likely differ in their commitment to the sport, experience level and investment in time and money. It is expected that the motivations of the two groups are different and that the goals that each group is on the River to achieve are different as well. Based on these differences, it would seem that conflict is likely to exist between the two groups.

Conflict

Conflict between user groups has become a significant issue in recent years. Public use of the outdoors has been increasing exponentially since World War II (Zinser, 1995). Unfortunately, the increase in users must take place on a finite resource base. As more and more recreationists use the same resource, people having different attitudes, motivations and preferences will be interacting. Also, public areas are being opened to more and more types of activities that are not always compatible.

A number of different types of conflict may occur between different users, and a number of theories attempt to describe them. Many of the theories of conflict focus on differences between the motivations and goals of different user groups. This view of conflict focuses on an individual's tolerance (or intolerance) of other groups. Tolerance has been defined as "one's willingness to share resources with activity groups other than one's own" (Ivy et al., 1992). Members of a group often perceive differences between themselves and members of other groups (out-groups) participating in different recreation activities within the same area. When an individual is evaluating his or her experience, encounters with members of other groups factor into the evaluation process. This brings us to the idea of activity style. Activity style is defined as "the personal meanings attached to the set of behaviors constituting a recreational activity" (Ivy et al., 1992). The conflict is not caused by the activities themselves, but to the personal meanings attached to the activities.

Another element that can lead to conflicts between users is the idea of a status hierarchy. Status hierarchies are developed by each user group within the group. They are often based on type of equipment or amount of experience

or expertise (Jacob & Schreyer, 1980). A hierarchy is also established in the minds of each of the groups. Often each group feels superior to the other based on activity type, purist attitudes or level of specialization. In certain activities, things can happen to disrupt the hierarchies that have been established in one's mind. "Hikers are often expected to step off the trail when meeting horse groups. Although it is safer for the hikers to step off than the horses, and easier on the land, hikers may experience conflict because stepping aside may imply that horse riders have higher status" (Watson et al., 1994). In much the same way, kayakers are often expected to wait near the sides of the River while rafts come through the rapids, or may be expected to move out of the way of rafts coming down through. Once again, it is easier for kayakers to maneuver than it is for the rafts, but the kayakers may experience a conflict in doing so.

There are a number of factors that can increase the likelihood of conflict occurring. The range of experience and definitions of quality will influence an individual's perceptions (Jacob and Schreyer, 1980). "A beginning kayaker may not know a river without powerboats, so freedom from encounters with them is not a part of the definition of a quality experience" (Nielsen et al., 1977). Other factors identified by Jacob and Schreyer (1980) are resource specificity, sense of possession, and intensity of participation. Drawing from specialization theory, the intensity of participation or focus of the activity as a central life interest will affect the user's perceptions. Interpersonal relationships, social values and skill level become central to the activity (Ditton et al., 1992).

Most often conflicts are asymmetrical in nature (Jackson & Wong, 1982). There are feelings of conflict in one group but not the other. This type of conflict is often the most visible and troublesome type of conflict with which managers have to deal. Most of the asymmetrical conflicts examined have been between motorized vs. non-motorized users of the resource. Differences between hikers and mountain bikers (Watson et al., 1994) and cross country skiers and snowmobilers (Knopp & Tyger, 1973) have also been the subject of research. In the case of asymmetric conflict, one group has feelings of conflict toward the other. However, the other group does not share those feelings or may even enjoy encountering the original group. It has been shown that this asymmetric conflict can persist rather than one group becoming tolerant of the other or the second group realizing that they are disliked and returning the feelings (Adelman et al., 1982).

Based on past research and an anecdotal understanding of the Deerfield River, we would expect a number of findings from this research. We would expect that 1) kayakers and rafters will differ in their motivations, 2) kayakers will score higher on feelings of crowding than rafters, 3) kayakers will have a higher incidence of feelings of conflict toward the rafters, and 4) it is anticipated that feelings of conflict would be asymmetric in nature (kayakers will perceive the existence of conflict, but the rafters will not).

Methodology

Data for this study were collected on six days during August weekends, since River use is highest during these

days. An eight-page survey was administered on-site as kayakers and raft customers were finishing their day on the River. On the Monroe Bridge section, there is limited access and all participants used only one take-out. Kayakers were surveyed on-site and asked to complete the survey at that time. Rafting customers were given the survey as they boarded buses for their trip back to the raft companies headquarters. They filled out the survey on the bus ride and it was collected later by research staff. On the Fife Brook section, there are more possibilities for take-out sites. The two most used take-out points were chosen for administering the survey to kayakers. The raft customers were surveyed at the individual companies base camps after their trip on the River.

The survey was a structured self-administered questionnaire which containing questions, among other things, about the motivations of users in choosing their activity on the Deerfield River, the perceptions of each group about the other group on the River, whether or not the numbers of a group of users was acceptable to them or not, and whether or not the presence of one group or the other causes safety problems or conflicts.

Results

In analyzing the data, it was decided that differences would be considered significant at the .1 level. This seems appropriate, since the consequences of making a type I error are minimal, and reduces the chances of making a type II error. A total of 1,163 questionnaires were returned for all groups on both sections of River (Table 1).

Table 1. Number of completed Surveys returned for Each User Group

| | Kayakers | Raft Customers | Total |
|-----------------------|----------|----------------|-------|
| Fife Brook Section | 190 | 185 | 375 |
| Monroe Bridge Section | 303 | 485 | 788 |
| Total | 493 | 670 | 1163 |

Motivations

It was predicted that kayakers and rafters would differ in the importance each group attaches to various motives as reasons for participating in their activity on the Deerfield River. We organized 15 motivational items into three categories: social, risk/uncertainty, and resource based. When comparing all kayakers and all rafters over the entire River, there were significant differences on 14 of the 15 motivational items (Table 2). A closer look at the motivations reveals that kayakers attached higher importance to 4 of 5 resource based items, such as those dealing with open space, freedom and items specific to the Deerfield. Rafters placed higher importance risk/uncertainty and on the social items. There was no significant difference found for only one item, that being comparing equipment.

When we considered only those surveyed for the Monroe Bridge stretch of River, the two groups differed significantly on 13 of the 15 items (Table 3). Kayakers had higher values for 4 of the 5 resource-based motivations. Rafters attached higher importance to items dealing with

risk/uncertainty. The two groups differed significantly on 4 of 6 social items. However, neither group consistently attached higher values on all of the items.

In contrast, when we consider only those surveyed for the Fife Brook section, we find significant differences for only 7 of the 15 items (Table 4). The items that become non-significant for users of the Fife Brook sections are the

excitement, uncertainty and risk items. The groups differ significantly on only 1 of the 4 risk/uncertainty items, with rafters again attaching a higher value to that item. Kayakers attached significantly higher values to 2 of the 5 resource-based items. The social category contained significant differences for 4 of the 5 items. Again, neither group attaches a higher value to a majority of the items.

Table 2. T-test results for significant differences between kayakers and raft customer motives for both sections of the river combined.

| Motive | Kayakers mean value | Rafters mean value | p-value |
|--|---------------------|--------------------|---------|
| Social: | | | |
| To compare my equipment with others | 1.440 | 1.434 | .920 |
| To be with friends | 3.505 | 3.773 | .000 |
| To observe rafters | 1.218 | 2.050 | .000 |
| To observe kayakers | 2.712 | 1.118 | .000 |
| To share my skill and knowledge with others | 2.454 | 1.941 | .000 |
| Because of the safety provided by the presence of other kayakers and rafters | 2.772 | 2.921 | .047 |
| Risk/Uncertainty: | | | |
| To experience adventure and excitement | 4.087 | 4.351 | .000 |
| Because of the chance for danger | 2.452 | 2.999 | .000 |
| To experience the risks involved | 2.871 | 3.306 | .000 |
| Because of the uncertainty of not always knowing what will happen | 2.789 | 3.359 | .000 |
| Resource Based: | | | |
| For the challenge of the river | 3.988 | 3.878 | .044 |
| Because things are exciting on the Deerfield | 3.416 | 3.176 | .000 |
| To enjoy the scenery | 3.774 | 3.519 | .000 |
| To have the freedom to move about on the river as I wish | 4.113 | 2.810 | .000 |
| Because of the open space here | 3.810 | 3.099 | .000 |

Table 3. T-Test results for Significant Differences Between Kayakers and Raft Customer Motives on the Monroe Bridge Section of the River for Mean Values for Motivational Items.

| Motive | Kayakers mean value | Rafters mean value | p-value |
|--|---------------------|--------------------|---------|
| Social: | | | |
| To compare my equipment with others | 1.461 | 1.415 | .493 |
| To be with friends | 3.576 | 3.754 | .012 |
| To observe rafters | 1.213 | 2.098 | .000 |
| To observe kayakers | 2.716 | 2.086 | .000 |
| To share my skill and knowledge with others | 2.468 | 1.914 | .000 |
| Because of the safety provided by the presence of other kayakers and rafters | 2.711 | 3.023 | .001 |
| Risk/Uncertainty: | | | |
| To experience adventure and excitement | 4.128 | 4.457 | .000 |
| Because of the chance for danger | 2.508 | 3.126 | .000 |
| To experience the risks involved | 2.883 | 3.475 | .000 |
| Because of the uncertainty of not always knowing what will happen | 2.839 | 3.516 | .000 |
| Resource Based: | | | |
| For the challenge of the river | 4.071 | 4.000 | .233 |
| Because things are exciting on the Deerfield | 3.568 | 3.280 | .000 |
| To enjoy the scenery | 3.702 | 3.367 | .000 |
| To have the freedom to move about on the river as I wish | 4.100 | 2.687 | .000 |
| Because of the open space here | 3.737 | 2.948 | .000 |

Table 4. T-Test results for Significant Differences Between Kayakers and Raft Customer Motives on the Fife Brook Section of the River for Mean Values for Motivational Items.

| Motive | Kayakers mean value | Rafters mean value | p-value |
|--|---------------------|--------------------|---------|
| Social: | | | |
| To compare my equipment with others | 1.415 | 1.486 | .433 |
| To be with friends | 3.432 | 3.808 | .000 |
| To observe rafters | 1.236 | 1.955 | .000 |
| To observe kayakers | 2.750 | 1.835 | .000 |
| To share my skill and knowledge with others | 2.432 | 2.009 | .000 |
| Because of the safety provided by the presence of other kayakers and rafters | 2.888 | 2.733 | .220 |
| Risk/Uncertainty: | | | |
| To experience adventure and excitement | 4.047 | 4.133 | .281 |
| Because of the chance for danger | 2.394 | 2.745 | .004 |
| To experience the risks involved | 2.880 | 2.955 | .522 |
| Because of the uncertainty of not always knowing what will happen | 2.738 | 3.023 | .019 |
| Resource Based: | | | |
| For the challenge of the river | 3.843 | 3.620 | .016 |
| Because things are exciting on the Deerfield | 3.184 | 2.963 | .032 |
| To enjoy the scenery | 3.881 | 3.831 | .618 |
| To have the freedom to move about on the river as I wish | 4.115 | 3.081 | .000 |
| Because of the open space here | 3.895 | 3.401 | .000 |

Table 5. T-Test results for Significant Differences Between Kayakers and Raft Customer for Conflict and Crowding Items for Both Sections of River Combined.

| Statement | Kayakers Mean Value | Rafters Mean Value | p-value |
|--|---------------------|--------------------|---------|
| The number of kayaks and rafts on the river was about right | 3.058 | 3.444 | .000 |
| There was an unsafe number of kayaks on the river today | 2.102 | 2.140 | .504 |
| Kayaks came too close in the rapids | 2.616 | 2.524 | .144 |
| Rafters came too close in the rapids | 2.576 | 2.012 | .000 |
| Going through the rapids was dangerous because of the number of rafts on the river | 2.668 | 1.973 | .000 |
| The number of rafts on the river today became a problem only when the rafts got in trouble | 2.537 | 2.176 | .000 |
| There was an unsafe number of rafts on the river today | 2.425 | 1.904 | .000 |
| How would you rate the following: | | | |
| The behavior of the kayakers | 3.932 | 3.874 | .302 |
| The behavior of the guides | 3.696 | 4.429 | .000 |
| The behavior of the customers | 3.473 | 4.212 | .000 |

Table 6. Acceptability of Numbers of Each Group

Question: Consider the number of rafts you observed or interacted with today. Was this number of rafts acceptable to you?

| | Kayakers | % | Chi ² | P | Rafters | % | Chi ² | P |
|--------------|----------|-------|------------------|------|---------|-------|------------------|------|
| Acceptable | 403 | 82.6 | 207.2 | .000 | 637 | 93.5 | 516.4 | .000 |
| Unacceptable | 85 | 17.4 | | | 44 | 6.5 | | |
| Total | 488 | 100.0 | | | 681 | 100.0 | | |

Question: Consider the number of kayakers you observed or interacted with today. Was this number of rafts acceptable to you?

| | Kayakers | % | Chi ² | P | Rafters | % | Chi ² | P |
|--------------|----------|-------|------------------|------|---------|-------|------------------|------|
| Acceptable | 431 | 86.9 | 270.0 | .000 | 621 | 90.5 | 450.6 | .000 |
| Unacceptable | 65 | 13.1 | | | 65 | 9.5 | | |
| Total | 496 | 100.0 | | | 686 | 100.0 | | |

Conflict

Potential conflict between the user groups was evaluated based on acceptability of numbers of the other group on the River, and dealt with how the numbers in each user group affected safety conditions on the River for the day. When we looked at the questions concerning the numbers of and behavior of the groups, significant differences were found between the groups on 7 of the 10 items for the full River (Table 5). Kayakers rated the level of conflict as higher on almost all of these items. This would indicate that kayakers are more apt to believe that the River is too crowded. However, even though kayakers attached higher values for all significant items, these mean values are lower than the neutral value of 3 on the scale.

Three items asked the respondents to rate the behavior of three different groups; kayakers, raft guides and raft customers. The groups did not differ in their perceptions of kayakers. They did differ significantly on the other two user groups with rafters rating the behavior of guides and customers as better than kayakers.

For the question of whether or not the number of rafts on the River was acceptable to each group, the Chi-square test was significant (Table 6). A closer look at the Chi-square table shows that more kayakers than expected thought the number of rafts was unacceptable than would be expected. More rafters than expected thought that the number of rafts was acceptable.

A closer look at the results shows that 6% of the rafters surveyed thought there were an unacceptable number of rafts on the River. Seventeen percent of the kayakers thought there was an unacceptable number of Rafts on the River. Thus, 83% of the kayakers thought the number of rafts on the River was acceptable. This would suggest that conflict on the River is low and/or that the level is acceptable at this time. When we look at the acceptability of the number of kayaks on the River we find that 9% of the rafters think the number of kayaks on the River is unacceptable. This is opposed to 13% of the kayakers who thought that the number of kayaks on the River was unacceptable. It would seem that the rafters are more tolerant of the kayakers than kayakers are of themselves. There is no question that the kayakers are less tolerant of rafts than they are of kayaks. What is surprising is the intolerance within the group.

Discussion and Conclusions

As expected the two groups differed in the values that they attached to motivational items. These differences suggest the two groups are different in the meanings they attach to their activities, suggesting that their activity styles are different. Similarly, there is a significant statistical difference in the way the users of the Deerfield River perceive each other and the amount of conflict perceived by each group. The level of conflict is not as great as one might expect based on differences between motivations and the level of interaction between the groups. Although the groups are different statistically, both groups placed values on the conflict items below the neutral value. Therefore, despite the fact that the difference is significant

statistically, the data suggests the existence of only a small amount of conflict between the two groups. Possible explanations for this lack of serious conflict could include the idea that the two groups have come to accept the fact that neither group is going to go away and they have come to tolerate one another.

The Deerfield River is an example of a river that has seen a major change in the amount and type of use taking place on it. As the users have changed, the regulations have also changed. The managers and regulating groups need to be aware of the possibilities for conflict that this causes. Although the conflict does not always manifest itself, the potential is there and care needs to be taken to ensure that all groups are represented.

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**WATER-BASED RECREATIONISTS' ATTITUDES
REGARDING CUSTOMER SATISFACTION:
DIFFERENCES BETWEEN SELECTED MARKET
SEGMENTS**

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Abstract: This study focused on the importance and performance levels of distinct user segments (campers, and day users) based on selected trip characteristic and socio-demographic variables. Data were collected at ten Corps-managed lakes in Summer 1997 (n=2933), based on a service quality model derived from the well known SERVQUAL model. Nineteen importance and performance items were tested under four domains (facilities, services, information, and recreation experience) and used to create four indexes. Results show that there were significant differences in 15 of 20 possible importance ratings, and 17 of 20 performance ratings, highlighting the importance of understanding the differences between user groups in managing recreation areas.

Introduction

The US Army Corps of Engineers, one of the nation's largest providers of water-based outdoor recreation opportunities, is responsible for the management of 463 lakes in 40 states across the United States. Driven by President Clinton's 1993 Executive Order focusing on improving customer satisfaction within federal agencies, the Corps began an aggressive customer satisfaction analysis program. This legislation, fully integrated with Vice President Gore's goal of making government friendlier and more accessible, provided outdoor recreation managers with an opportunity to focus on the ultimate goal of all recreation providers: to improve the quality of the experience for the recreationist.

Pilot studies were conducted by several researchers in the completion of this effort. Researchers from the US Army Corps of Engineers Waterways Experiment Station (WES), Penn State University, and the USDA Forest Service were involved in the selection of the satisfaction items used in the attempt to measure recreational customer satisfaction. Additionally, the results of two pilot studies conducted in recreation settings in Australia were incorporated into the formulation of the nationwide customer satisfaction effort. This paper presents partial results of a nationwide customer satisfaction study conducted during the summer of 1997 at 10 Corps lakes known as Recreation Research Demonstration Units (RRDUs).

When attempting to understand recreational customer satisfaction, many researchers have sought out the works of well-known marketers, such as Parasuraman, Zeithaml, and Berry; Rust and Oliver, and the likes. Almost without exception, the satisfaction domains established by these researchers (specifically Parasuraman, Zeithaml, and Berry) have been used as the framework against which customer satisfaction was measured. The SERVQUAL method (Parasuraman, Zeithaml, and Berry, 1988) provided managers with a structure of five satisfaction dimensions (Tangibles, Reliability, Responsiveness, Assurance, and Empathy) under which as many as 30 items were placed. These satisfaction dimensions have been used in other forms, with just three or four domains used in some studies, and all five used in others. In some form, these satisfaction domains have been used extensively since first developed in 1985. MacKay and Crompton (1990) introduced the SERVQUAL methodology to the field of recreation, and developed a variant called REQUAL, which used all five of the SERVQUAL satisfaction dimensions, and a pool of items specifically applicable to recreation centers.

More recently, the five satisfaction domains have been changed to better represent understandable concepts that managers can use in the day-to-day operation of their recreation facilities. Oriented to outdoor recreation management, Absher et al. (1996) and Howat et al. (1996) developed three very broad-based satisfaction domains (Facilities, Services, and Information) for use in measuring customer satisfaction.

The most current known derivation of the SERVQUAL/REQUAL methodology was developed by Burns, Graefe, Absher and Titre (1997), and expands on the three-domain effort by including the concept of recreation experience as a fourth domain. The four domains of the most recent model, called FIRESQUAL, include Facilities, Services, Information, and Recreation Experience.

The addition of the recreation experience dimension was a logical addition to a customer satisfaction model specifically designed to meet the needs of outdoor recreation managers. FIRESQUAL consists of 19 individual items spread evenly across the four domains (Table 1.), and was tested at ten US Army Corps of Engineer lakes in 1997 (n=2933).

Table 1 Reliability Coefficients for Customer Satisfaction Domains

| Importance/Performance Domains and Items | Alpha | Alpha |
|--|------------|-------------|
| | Importance | Performance |
| Facilities | .64 | .73 |
| Accessibility for Persons With Disabilities | | |
| Availability of Recreation Areas | | |
| Appearance of Recreation Areas | | |
| Value for Fee Paid | | |
| Adequate Ranger Patrols | | |
| Services | .77 | .84 |
| Availability of Staff to Answer Questions | | |
| Staff Visibility | | |
| Safety/Security | | |
| Friendly and Courteous Staff | | |
| Opportunity to offer Suggestions to Staff | | |
| Information | .81 | .86 |
| General Information about Area | | |
| Nature/historical Information | | |
| Safety Information | | |
| Ease of Obtaining Information | | |
| Current and Accurate Information | | |
| Recreation | .73 | .82 |
| Opportunity to Recreate without Crowding | | |
| Opportunity to Recreate without Interference | | |
| Compatibility of Recreation Activities | | |
| Places to Recreate without Conflict | | |

Methods

The focus of this paper is to examine the differences in importance and performance levels across different user groups, or market segments. The concept of market segmentation has been studied by recreation researchers in many settings. Andereck and Caldwell (1994) examined segmentation in a public zoo setting, remarking that "understanding the diversity of participant needs and desires allows organizations to manage resources in the most efficient manner." Donnelly et al. (1996) pursued the notion of person-occasion segmentation, which focuses on not only the different user groups visiting the recreation area, but the different natural resource attributes of the area that they were visiting.

Focusing on visitor characteristics, Absher et al. (1996) found significant differences among users' expectations of recreation service and activity attributes at "leisure centres" in Australia and New Zealand. Most recently, Absher (1998) examined visitor preferences and perceptions across a variety of user groups in two southern California National Forests. This research showed significant differences between campers, day users, and wilderness users.

Clearly, managers need to understand the different needs of the various user groups that are visiting the recreation areas under their management. This paper focuses on an examination of satisfaction levels across users' trip characteristics and socio-demographic attributes. Respondents were asked to indicate the degree of importance and performance associated with 19 satisfaction attributes using a 5-point Likert scale. The overall importance and performance levels of respondents were examined in relation to their level of *previous experience at*

that lake, age of respondent, distance from primary residence, length of stay, and group composition.

In this analysis of customer satisfaction across user groups, a field survey of US Army Corps of Engineers recreation visitors was conducted across ten lakes in ten different states. These data were collected in the summer of 1997, through the use of face-to-face interviews by college students and Corps personnel, with the goal of 300 surveys per lake, resulting in 2933 completed surveys.

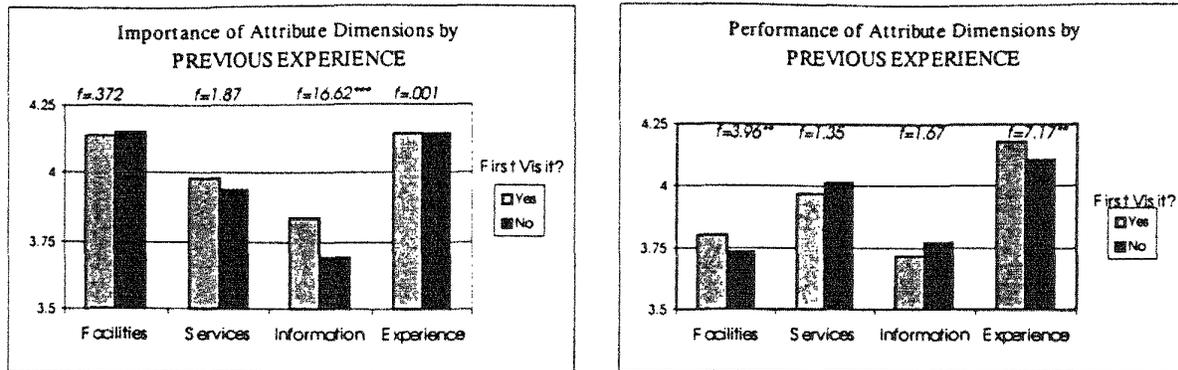
One-way analysis of variance was used to examine the satisfaction domain importance and performance against five variables, *experience at that lake, age of respondent, distance from primary residence, length of stay, and group composition.* Items from each of the four domains were used in the creation of indexes, and the reliability coefficients (Fig. 1) showed somewhat lower scores for the importance domains.

Results

Previous Experience at Recreation Area

The results shown below (Figure 1) indicate that those recreationists who had not visited the lake previously (*first-time visitors*) were more likely to associate a high degree of importance with the availability of information, an expected result. When looking at the levels of performance, however, first-time visitors reported significantly higher scores for items associated with the quality of their recreation experience and facilities domain. There was no significant difference regarding *first-time visitors'* and *repeat visitors'* perceptions of performance of information or service domain attributes.

Figure 1. Importance and Performance Dimensions by Previous experience



* significant at the .05 level, ** significant at the .01 level, *** significant at the .001 level

Age of Respondent

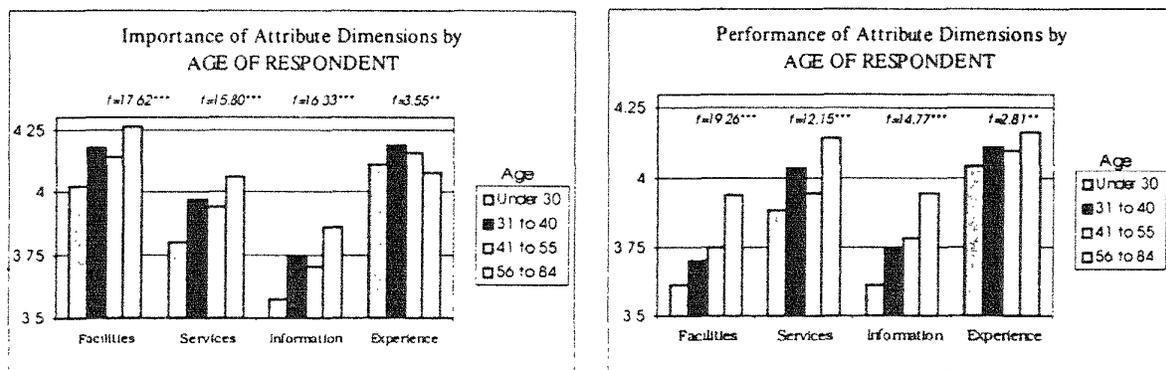
Regarding the differences between age groups, the data showed significant differences across all four domains (Figure 2). There was a bi-polar response, with those in the "30 or younger" category, and those 56 years or older indicating the most distinct preferences and perceptions. Visitors between the ages of 31 to 55 reported no unusually high or low importance or performance ratings, although they placed the most importance on the recreation experience domain.

Visitors who were in the category "30 or younger" generally demonstrated lower scores in both importance and performance across the four domains. This group of visitors placed little importance on services and

information, indicating that the recreation experience and facilities were most important to them. The "30 or younger" group rated the performance of facilities and information much lower than services and recreation experience. The quality of the recreation experience received the highest performance ratings by this segment of visitors, followed by the services domain.

Those visitors 56 years or older also stood out from the other age groups in the high degree of importance that they place on facilities, services, and information. Interestingly, these older users placed the lowest level of importance on the items associated with the recreation experience domain. These visitors reported the highest performance scores across all four domains.

Figure 2. Importance and Performance Dimensions by Age of Respondent



* significant at the .05 level, ** significant at the .01 level, *** significant at the .001 level

Distance from Visitors' Primary Residence

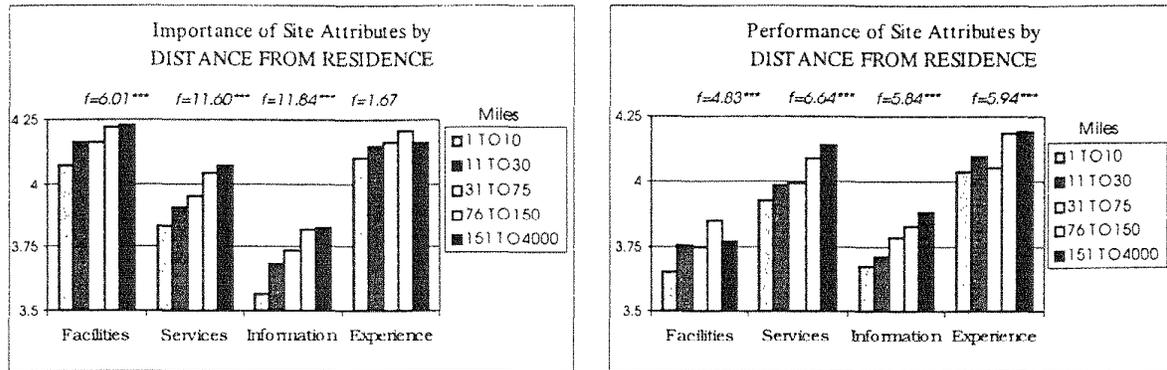
When examining the perceptions of respondents by distance from their primary residence, those visitors who had traveled the farthest generally indicated a higher degree of importance and performance across most of the four

satisfaction domains (Figure 3). This is a logical finding in that those visitors who live further away may tend to visit the recreation areas less frequently than those living within, for example, 1-10 miles.

Those who had traveled further distances showed greater disparity regarding importance than performance, particularly in the services and information domains. The farther the visitor had traveled, the more important the satisfaction attribute became, with the exception of the recreation experience domain. When examining performance, all four domains showed significant

differences, once again showing the impact of distance on a visitor's perceptions and preferences. Visitors traveling greater distances tended to give more favorable performance ratings for all four satisfaction domains. The differences noted in the performance chart, however, were not as strong as the visitors' perceptions of what is important.

Figure 3. Importance and Performance Domains by Distance from Primary Residence



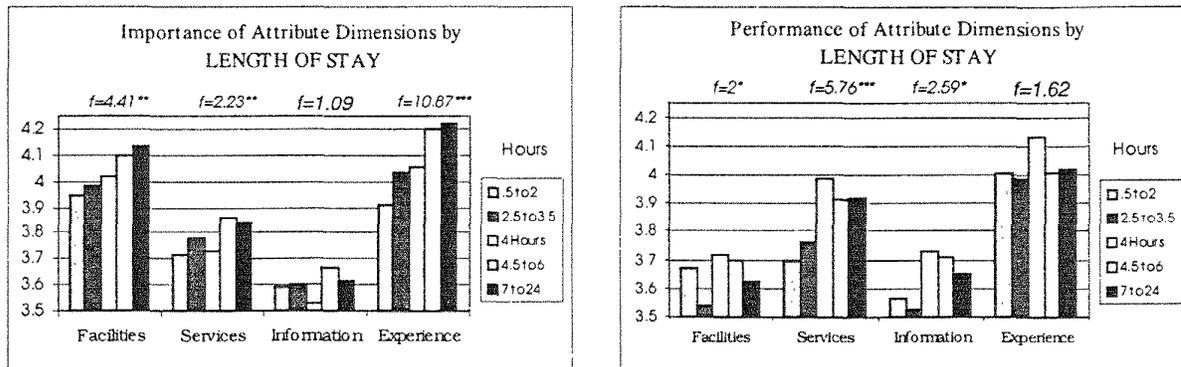
* significant at the .05 level, ** significant at the .01 level, *** significant at the .001 level

Length of Stay at the Recreation Area

Overall, the importance ratings were somewhat higher for those visitors who were staying at the recreation area for a longer period of time (Figure 4), with items in the experience, service, and facilities domains showing significant differences. Importance ratings show that those visitors staying longest attach the most importance to the experience and facilities attributes especially.

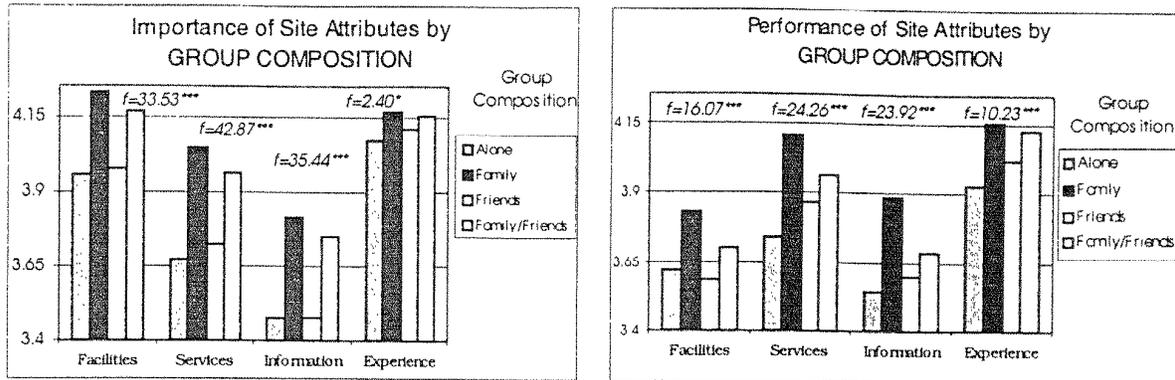
There were significant differences in the performance of services, information, and facilities, with those visitors in the middle range (4 hours, 4.5 to 6 hours) accounting for much of the difference. Additionally, although there was a significant difference in the importance of the visitors' recreation experience across the different categories, there was no significant difference regarding the performance of recreation experience attributes.

Figure 4. Importance and Performance Domains by Length of Stay



* significant at the .05 level, ** significant at the .01 level, *** significant at the .001 level

Figure 5. Importance and Performance Domains by Group Composition



* significant at the .05 level, ** significant at the .01 level, *** significant at the .001 level

Group Composition

Lastly, when examining the impact of *group composition* on the importance and performance scores of respondents (Figure 5), significant differences were found across all four domains. The visitors who indicated that they were in a family-oriented group had significantly higher scores for both importance and performance. Those visitors who were in groups of family and friends rated all four satisfaction domains somewhat lower than family only groups. Visitors who reported that they were alone or with friends rated the importance and performance of the satisfaction items lower across all four domains.

Discussion and Implications

The primary conclusions ascertained from these data and the results expressed in the above charts reflect the importance of understanding the different preferences and perceptions of different user groups. In this analysis the different user groups were examined by comparing trip characteristics with levels of importance and performance across four domains; facilities, services, information, and recreation experience.

This analysis tested 40 possible relationships, four measures of both importance and of performance across five segmentation variables as indicated previously. Most importantly, it should be noted that there were significant differences in 15 of 20 possible importance ratings, and 17 of 20 performance ratings, indicating that there are indeed significant differences between these selected user groups. The *age of respondents*, *distance from the primary residence to the recreation area*, *length of stay at the recreation area*, and *group composition* all play a major role in explaining the preferences and perceptions of recreationists. Interestingly, the weakest relationship regarding the importance and performance of recreationists was for *previous experience*, which was somewhat surprising, since one would expect repeat visitors to have different perceptions and preferences than first-time visitors.

The facilities domain showed the highest number of significant relationships across the five variables. Four of

five facilities measures of importance showed significant differences, and all measures of performance were significantly different. The single insignificant item was the importance of facilities in relation to *previous experience* at the recreation area. Similarly, analysis of the services domain showed that four of five importance and performance indicators were significant. Within the services domain, no significant differences were noted for the *previous experience* category.

The information domain also showed a high number of significant relationships, with four of the five importance and performance measures showing significant differences across the five variables. The relationship between *length of stay* and the importance of information was not statistically significant. Interestingly, there was no significant relationship between the performance of the information items and *previous experience* at the recreation area.

The experience domain showed the lowest number of significant relationships, with three of the five importance and four of the five performance tests showing significant differences across the five variables. The importance of recreation experience was not significantly different regarding *previous experience* and *distance traveled from the users' primary residence*. Additionally, there was no significant difference regarding the performance of items in the recreation experience domain in relation to *length of stay*.

It is clear that a keen understanding of visitors can play a major role in a manager's effort to improve customer service. Though clearly not the only unit of measurement used to predict satisfaction, understanding visitors' demographic make-up and trip characteristics is a step in the right direction.

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**Recreation and Tourism Trends
in the Northeast**



CROWDS AT SPECIAL EVENTS: AN EXAMINATION OF PERCEIVED CROWDING AT A FIRST NIGHT® EVENT

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Abstract

Traditionally, the examination of crowding issues in recreation research has taken place in outdoor recreation settings such as parks and other natural areas, and has usually focused on the negative aspects associated with crowding. However, the way in which individual visitors perceive and interact with other visitors should be important to planners and managers of all types of leisure settings and events, including festivals. Furthermore, crowding has been found to be a multi-faceted concept that may be related to a host of visitor and setting characteristics. In some cases large crowds may even positively impact visitor experiences by contributing to the festive atmosphere of the event. The purpose of this study was to examine both the positive and negative effects of crowds on visitor experiences at the 1998 First Night® festival in New York City. In order to do this, a five item crowding index based on Anderson's (1997) research was developed. Relationships between the mean score for the crowding index and several variables including expected crowd size, overall visitor satisfaction, and visitor group composition variables were examined. The results of this research identify which facets of crowding most effect (negatively and positively) event visitors, as well as help planners and managers better understand how perceived crowding effects the experiences of visitors.

Introduction

First Night® events are a New Years Eve celebration of the arts that occur in several cities throughout the United States and elsewhere. These festivals may include a variety of visual and performing arts, parades and fireworks for example, and can be held both indoors or outside.

This analysis on the New York City 1998 First Night® event was part of a larger study by Penn State researchers examining First Night® events in the five communities of: New York City, NY, Pittsburgh, PA, Providence, RI, State College, PA, and Wilmington, DE.

Traditionally, crowding in recreation studies has been examined in outdoor backcountry or natural settings. These studies have generally focused on crowding as a

negative assessment of certain density levels. However, crowding has been found to be a multifaceted concept that may be related to a host of visitor characteristics across a variety of settings. More recently, some researchers have become interested in crowding issues within frontcountry and more urbanized settings. They have found that large crowds may actually contribute to the festive atmosphere of an event by stimulating excitement among visitors. This positive perception of crowding has been defined as functional density.

The primary purpose of this study was to explore the concept of crowding within the context of a front country/urban/event setting. A secondary purpose was to explore the relationships between crowding perceptions and other variables such as visitor demographics, site specific variables, expectations, and overall satisfaction.

Methodology

Data was collected on New Years Eve at the New York City First Night® event using a brief on-site interview followed by an in-depth follow-up questionnaire. A total of 403 First Night® attendees were systematically sampled. The follow-up questionnaire yielded 208 returned surveys (52%). Perceptions of crowding were assessed with a five-item 7 point Likert scale crowding index based on Anderson's (1997) research with the Northwest Folklife Festival. Table 1 provides an examination of the reliability of this index and also shows that overall perceptions of crowding at the First Night® event were positive rather than negative.

Table 1 Reliability of Crowding Scale

| Variable | N | Mean | S.D. | Alpha if deleted |
|---|-----|------|------|------------------|
| Degree to which other attendees contributed to the experience | 182 | 4.89 | 1.41 | .73 |
| Sights, Sounds and movements within First Night® | 182 | 5.69 | 1.36 | .71 |
| More or fewer people at the event | 182 | 4.16 | 1.13 | .69 |
| Food, Information & Vendor Lines | 182 | 4.95 | 1.49 | .69 |
| Performance Lines | 182 | 4.98 | 1.87 | .69 |
| Total | 182 | 4.93 | .99 | |

Alpha = .75

Results

A variety of statistical tools were used to test for differences in the crowding index scores across several demographic variables. No significant differences were found between genders, income groups, groups of different sizes, and family composition groups in crowding index scores. Surprisingly, significant differences were found in relation to age, with older respondents reporting that they had a more positive perception of the crowd size (r=.148).

Previous research and open ended questions in this survey suggested that perceptions of crowding may also depend on what respondents did while at an event. Therefore, differences between respondents who reported that they attended at least one of 12 different venues while at First Night® were also examined. Similar to the majority of the demographic variables, no significant differences were found between venues attended and perceived crowding. Several studies have suggested that there is a link between visitor's expectations of crowd size and perceived crowding, with visitors who expect large crowds to be more tolerant of crowded situations than visitors who expect fewer people. This was also found to be the case at First Night® New York. Using one-way analysis of variance, differences between three groups in relation to their crowding index scores were noted (Table 2). As expected, respondents who anticipated a smaller number of festival goers reported lower perceived crowding scores than respondents who had anticipated accurately or expected more people at the event.

Table 2 Relationship between crowd size expectations and perceived crowding

| Crowding Expectation | N | Mean | Standard Deviation | F | Sig. |
|-----------------------|-----|-------|--------------------|------|------|
| Expected fewer people | 51 | 4.48 | 1.32 | | |
| About what I expected | 74 | 4.95* | .89 | 9.54 | .000 |
| Expected more people | 57 | 5.32* | .74 | | |
| Total | 182 | 4.93 | 1.04 | | |

* No significant difference between the two groups designated

Another purpose of this study was to explore the relationship between crowding perceptions and overall satisfaction of the event. While much of the crowding research has been able to determine variance in crowding perceptions among visitors, often times researchers have struggled to determine how these preferences effect the satisfaction of visitors. However, a relatively strong (.607) correlation between these two variables was found in this

study (see Table 3). As expected, respondents with positive (functional) perceptions of the crowd reported higher levels of overall satisfaction with the event than did visitors who felt that the crowd size was too large.

Table 3. Relationship between perceived crowding and overall satisfaction

| Variable | N | Mean | Standard Deviation | R | R ² |
|----------------------|-----|------|--------------------|------|----------------|
| Crowding Scale | 182 | 4.93 | 1.04 | | |
| Overall Satisfaction | 182 | 5.30 | 1.33 | .607 | .37 |

Conclusions and Implications

Contrary to earlier studies which found crowds to have a negative effect on visitor enjoyment, crowds in this study were found to contribute to the functionality or positive atmosphere of a festival or front country setting. Overall, First Night® visitors perceived the crowd to be positive (functional). This suggests that crowding perceptions are not necessarily related to visitor density, but may be more dependent on setting and type of activity.

Perceptions of crowding at First Night® remain constant across different demographic groups (gender, income, group size, group composition, etc.). Although these variables were not found to be related to crowding in this study, they should not be discounted in future efforts due to the multi-faceted nature of crowding.

Expectations of visitors are important. This notion was supported by the findings that expectations for crowding are significantly related to how visitors perceive crowding at First Night®, and that visitors perception of crowding at First Night® significantly influenced their satisfaction with the event. This suggests that managers interested in increasing visitor satisfaction may not need to focus on crowd control as much as previously thought. Instead they should concentrate on improving the accuracy of visitors' expectations of crowd size.

VOLUME SEGMENTATION OF SELECTED RECREATION ACTIVITIES IN THE NORTHEASTERN UNITED STATES: 1982-1996

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Abstract - The purpose of this review was to examine volume segmentation within three selected outdoor recreational activities -- swimming, hunting and downhill skiing over an sixteen-year period, from 1982 through 1996 at the national level and within the Northeast Region of the U.S.; and to determine if trend patterns existed within any of these activities when the market size and market volume of light, moderate and frequent participation segments were examined. Different trends exist between national and northeast regional trends when volume segmentation was examined. Implications and discussion points were provided. Keywords. Volume segmentation, swimming, hunting, downhill skiing, marketing, Northeast U.S., outdoor recreation, and activity trends.

INTRODUCTION

With the advancement of the recreation field in the last decade has come the increased interest in the topic of marketing recreation activities and amenities. This interest has also been fueled by the growth in travel and tourism and an increasing variety of recreational products and services. In recent years, there has been substantial growth in a variety of outdoor recreational activities. These include golf, wind surfing, cross country skiing, and fly-fishing plus the introduction of new pursuits such as snowboarding, mountain biking, and "in-line skating." However, in other outdoor activities the growth of activity participation has either remained stagnant or actually declined. These activities include swimming, power boating, and snowmobiling to name a few. Consumers now have more choices both across activities and within activities. Given all of these changing conditions, the implementation of marketing strategies and the monitoring of trends has become critically important for those agencies and businesses which depend on participation of the public in selected outdoor recreational activities. Growth cycles change rapidly and more innovative market approaches are necessary. Kelly (1988) and others (Warnick 1991; Schwanager, 1989) have conducted work which serves to predict future recreation participation. Others have also

found that national activity trends are not necessarily reflected at the regional level (Warnick and Vander Stoep, 1990). Nevertheless, more detailed analyses of recreational activity trends are needed at the national, regional and local levels.

In 1991, Warnick (1991) first examined three recreational activities in-depth within the Northeast from the year 1982 through 1989. These activities included hunting, swimming and downhill skiing. He found that for swimming, regional trend patterns in the Northeast reflected the national trends. While although the pattern of change was similar in both the national and northeast region; the difference in the distribution was more distinct. For downhill skiing, he found a larger increase at the regional level than at the national level for both market size and volume. A reverse trend was noted in hunting in the Northeast. While the overall national market of frequent hunters increased, the market in the Northeast declined. He concluded that national trends are not necessarily reflected at the regional level. He also suggested that the monitoring of trends may indicate life cycle changes in an activity at the regional level. For example, the findings noted that the activity of swimming appeared to have become a mature activity. There is no strong new influx of new swimmers, but a steady, growing market who desire to swim and who are swimming more frequently. He also indicated that "segmentation change" over time was an important issue to address. People who participate in recreational activities often change their rates of play for numerous reasons that we may not understand; but monitoring the volume segments may provide insights into how these changes occur over time. Part of this study was to extend this analysis to determine if regional trend patterns still exist which reflect or do not reflect national trends.

To understand the nature of recreational activity trends and participation, two major components of activity demand must be understood. First there is the "number of people who participate in the activity." This statistic is called "market size." Often, much is made of this statistic; however, in and of itself it is somewhat less meaningful than a statistic which more specifically quantifies demand. "Participation days" or "times played" is a much more meaningful statistic for recreation agencies and businesses. This addresses the actual volume or amount of people who pass through the area or facility or who play the activity any number of times. It is referred to as "market volume." In marketing, business volume when examined by groups is described as a form of user or behavioral segmentation and is called "volume segmentation." Volume segmentation is the examination of usage rate and size of specific markets within an activity or product category. Romsa and Girling (1978) wrote one of the more definitive articles on volume

segmentation of recreational activities. Others have alluded to the market concept called the 20-80 rule (which indicates that a small portion of all customers comprise a large portion of all business transactions). Warnick and Vander Stoep (1990) have indicated that there are regional differences for many recreational activities. However, their review of selected activities did not focus on participation volume. Consequently, the review of participation volume within three selected activities in the Northeast was undertaken to update the 1991 study by Warnick.

PURPOSES OF STUDY

The purposes of this study were two-fold: 1) to examine volume segmentation within three selected outdoor recreational activities -- swimming, hunting and downhill skiing over an sixteen-year period, from 1982 through 1996; and 2) to determine if trend patterns exist within any of these activities when the market size and market volume of infrequent and frequent segments were examined.

METHODS

For the analysis of volume segmentation of these activities, data were drawn from *Study of Media and Markets* (Simmons Market Research Bureau, Inc., 1982-1996). These annual market studies were stratified, national random probability samples for each year. The methods included the distribution of self-administered questionnaires and follow-up telephone interviews. Sample sizes ranged from approximately 20,000 to 29,000 adults. The sample statistics were then extrapolated to the U.S. adult population of 18 years of age and older. The activities in this review were selected because they represented outdoor seasonal events and the data were available and complete over this period of time by segments and by region for each activity. The data were made available through Simmons Market Research Bureau of New York and the University of Massachusetts Library.

Definitions of terms are important here and must be read carefully. The way segments are described can be confusing; so, please read carefully and use caution in use of these data. The terms are explained as follows. First, use segments or volume patterns at the national level were defined by three groups: 1) "Light Users" -- those that participated 1 to 4 days during the 12-month period; 2) "Moderate Users" -- those that participated 5 to 19 days during 12-month period; and 3) "Heavy Users" -- those that participated 20 or more days during 12-month period. These definitions of activity demand as provided by Simmons Market Research Bureau do provide stable trend data on an annual basis; however, they are not linked to demographic or regional distributions of demand.

Simmons Market Research Bureau does provide demographic definition and regional distribution of all activity participants and frequent participants (i.e., "those involved in the activity more frequently based on an activity play level.") However, the detailed definition of this group, the frequent segment or "those involved more frequently," varies from activity to activity. For the purposes of this study, within each activity, frequent and infrequent groups were defined. Knowing the overall national and regional activity population as detailed by demographics and regional distribution, one can extrapolate to an infrequent user group. In this review for swimming -- frequent swimmers are those who swim 20 days or more per year and infrequent swimmers are those who swim less than 20 days per year. For hunting, frequent hunters are those who hunt 10 days or more per year and infrequent hunters those who hunt less than 10 days per year. For downhill skiing, frequent skiers are those who ski five days or more per year and infrequent skiers those who ski less than five days per year. Please note the use of different terms here -- frequent and infrequent versus light, moderate and heavy users. Infrequent participants are not the same group as light users. For swimming, infrequent swimmers are those who swim less than 20 days per year and light swimmers are those who swim one to four days per year. Differences in these definitions must be carefully considered when reviewing the findings for each of these activities. Light, moderate, and heavy represent volume groups are described at the national level only and are a more refined segmentation of the infrequent and frequent groups. But, it was not possible to examine these segments at the regional level due to the way Simmons Market Research Bureau presented the data. Only infrequent and frequent segments can be examined at the regional level over the time period. Just recently, within the 1996 data, has Simmons Market Research Bureau made available the data case by case so one may examine more refined segmentation data at the regional level. However, it is not possible to examine these data over time as only one year is available.

Other definitions used in this study include: a) "Volume or Participation Days" -- an estimate of the number of activity occurrences, the medians were used from each grouped category (1 to 4 days; 5 to 9; 10 to 14; 15 to 19; 20 to 24; 25 to 29; 30 to 39; 40 to 49; 50 to 59; and 60 or more) times the number of participants who indicated playing at this level; b) "Market Size" -- the total number of adults (18 years of age and older) who played the activity in the previous 12 month period for the year; c) "Average Annual Growth Rate" -- the percent change in terms of the size of the market or participation calculated as a percentage; derived by taking current year number (market size or market volume) subtracting previous year

number and dividing by the previous year number; percent change from year to year was then averaged over the study period; d) "Average Size" -- the percent distribution of participants by user group in terms of number of players and number of activity days averaged over the study period; e) "Days Played Per Year" -- the volume or participation days divided by total number of participants per segment; f) "Market Share" -- percent of all volume played within a specific region (which are defined as Northeast, South, Midwest, and West); g) Northeast Region -- includes the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, and New Jersey; and h) "Moving Average (MA) 3-Point Change" -- a moving average trend calculation based on a three-point moving average where change is calculated based on increments of three year averages (i.e., 1982, 1983, and 1984 would be used to determine a 1983 average; 1983, 1984, and 1985 would be used to determine a 1984 average, etc.). Changes were then determined by developing moving averages for three year periods from 1983 through 1996. Moving averages are used in trend extrapolations to smooth the effects of short-term variation and to provide the opportunity to construct more accurate trend patterns (McClave and Benson, 1982).

SELECTED FINDINGS

The findings from this review are presented by activity with reference first to the national trends and then presentation of the regional findings from the Northeast. The summary of national trends is by total participants and participation days; and light, moderate and heavy users for each activity.

Swimming

National Trends. Swimming is an activity which has increased only slightly nationally in market size over this time period. Approximately 51 million people swam at least once per year in 1982; but, by 1996 only 59 million swam. However, the activity did not steadily increase over this period. The number of participants dropped to as low as 42 million in 1991 before rebounding. In fact, the highest number of swimming participants was in 1995 when 61 million people swam. The activity has increased in market size at an average yearly rate of 1.7 percent and at a 3-point moving average rate of 2.1 percent. Swimming, in terms of participation days (market volume) actually grew during this period. The number of swimming days in 1982 was 983 million and by 1996 it was 1,163 million days. In 1991, swimming days were at their lowest level at 733 million days and the increase has been steady since that year. On average at the national level, the heavy swim segment accounts for 34 percent of the all swimmers, but nearly 73 percent of all swimming activity. When light, moderate and heavy segments were examined over time, each user segment grew from 1982 through 1996 in both

market size and volume. The number of light users grew the most by market size (2.3%) and the heavy segment grew the most in terms of market volume (2.8%). Overall the average number of days per swimmer have changed relatively little during this period (up only 0.6%).

Northeast Trends. The market size of swimmers in the Northeast grew at the same rate as the national number of swimmers. In 1982, 11.8 million swimmers were from the Northeast and in 1996 the number equaled 13.6 million. However, the changes in the swimming market did not reflect the same changes as the national changes. The number of swimmers reached its lowest point in 1988 at 8.8 million swimmers. After this period the market in the Northeast generally grew overall. Participation days in the Northeast have not changed much (up only 0.5% from 1982 to 1996). The peak in the Northeast was in 1983 when nearly 304 million swimming days occurred, but this declined to a low of 172.8 million days in 1993 and in the most recent years examined here (1994 to 1996), the number of days rebounded to over 250 million participation days. The average number of days per swimmer in the Northeast has declined slightly (-0.9% during this period). Furthermore, the market share of swimmers who reside in the Northeast has changed only slightly (up 0.4% per year). The Northeast's share of all swimmers peaked in 1983 at 26.2 percent and declined throughout the remainder of the period and in 1989 stood at 18.7 percent before rebounding to over 22 percent in the mid-90s.

When the distributions of frequent and infrequent swimmers were examined additional insights into activity trends within the Northeast were found. The distribution of frequent and infrequent swimmers in the Northeast is different than the distribution at the national level. In every year examined here, the distribution of infrequent swimmers in the Northeast is less than at the national level. For example in 1982, 74 percent of all swimmers at the national level were infrequent swimmers while slightly less than 70 percent (69.6 percent) of all swimmers in the Northeast were infrequent swimmers. By 1996, the distribution of infrequent swimmers at the national level was 64 percent and the distribution in the Northeast was 63 percent. At the national level, there was an indication that an increasingly smaller distribution of all swimmers were infrequent participants. In 1982, 74 percent were infrequent swimmers and by 1989 only 64 percent were infrequent swimmers. The trend has been somewhat similar in the Northeast, but the actual distribution is markedly different. Approximately 70 percent of all swimmers in the Northeast were infrequent swimmers in 1982. In 1996, only 63 percent were infrequent swimmers. While this is revealing, the other segment, the frequent

swimmer group is accounting for a larger portion of the swimming types and this segment actually grew -- at an average annual rate of about three percent and at a 3-point moving average rate of over two percent. The national trends also indicate a stronger growth pattern within the frequent segment. This segment grew at an average annual rate of 5.4 percent and at a 3-point moving average rate of 4.3 percent.

The overall Northeast swimming market has increased in size and most of the increase appears to be the result of more frequent swimmers who are swimming more often. The swimming market in the Northeast has become increasingly configured by a higher distribution of frequent swimmers. The average number of swimming days per swimmers has actually declined from 1982 through 1996, from 22.9 days per swimmer to 18.9 days per swimmer -- an decrease of nearly four days per swimmer. This decline has been offset by simply more swimmers and a larger portion of frequent swimmers who swim more often. Compared over the same time period at the national level, the average number of swimming days per swimmer changed only modestly from 18.5 days in 1982 to 19.1 days in 1996 -- an increase of less than one day per swimmer.

Hunting

National Trends. Hunting is an activity nationwide undergoing change at both the national and regional levels. The overall market is growing at an annual average rate of two percent per year (3-point moving average rate of one percent). Hunting activity days are up though -- over six percent per year (3-point moving average rate of four percent). Approximately 12.5 million people hunted at least once per year in 1982 and by 1996, 16.2 million hunted. Hunting should not be characterized as a stable activity over this period. In terms of market size, it declined erratically from 1982 through 1991 and has since rebounded in terms of both market size and volume. The number of hunting days alone increased from 135 million in 1991 to 345.4 million days in 1996. On average at the national level, the heavy hunting segment accounts for 27 percent of the all hunters and 64 percent of all hunting activity. When light, moderate and heavy segments were examined over time, the only user segment which grew substantially from 1982 through 1996 was the heavy hunting segment. The number of heavy hunters and hunting days among this group grew at an average annual rate of nearly eight percent per year.

Northeast Trends. Hunting in the Northeast is for the most part has fluctuated between 1.4 million (1991) to as high as 2.8 million hunters (1996); but, there is evidence of fluctuations both up and down in the activity. The lowest

number was 1.4 million in 1991. The average number of hunting days in the Northeast has increased and remains between 15 and 17 days per year through 1993 and thereafter it has increased to over 20 days per year. The average number of days per hunter in the Northeast has been about one day higher than the national level. The changes in the number of frequent and infrequent hunters was different in this overall time period. The distribution of infrequent hunters is down both in the Northeast and at the national level. The decline is the distribution of infrequent hunters has been slightly higher in the Northeast than at the national level. The distribution of hunters in both the Northeast and the nation reveals a market configured by higher distribution of frequent hunters. During this time period, the distribution of frequent hunters at the national level began to consistently exceeded 50 percent after 1991; however, the distribution in the Northeast was substantially different. Only twice did the distribution of frequent hunters drop below 50 percent (in 1989 -- 49.2 percent and 1993 -- 48.3 percent) in the Northeast. The distribution has normally been above 53-54 percent and has been as high as 67 percent (in 1996). Nevertheless, in the Northeast, there has been an increase in the number of frequent hunters and the higher distribution of these types of participants over this period.

Downhill Skiing

National Trends. Skiing is an activity which has grown during this period. Approximately 6.7 million people downhill skied at least once per year in 1982 and by 1996, 10.5 million skied. The overall average annual growth rate in market size was 4.9 percent and for participation days 6.0 percent. The growth in skiing appears to be largely accounted for by the growth in the heavy use segment. While, all segments grew in the skiing market, the heavy segment grew the most. The average annual growth rate for market size was nearly 18 percent and for participation days was slightly over 23 percent. But, these statistics are misleading. The changes were the result of uneven, year-to-year fluctuations and not necessarily sustained, consistent growth. For example, the year-to-year numbers and percent changes for the heavy user ski market for a few years indicate the magnitude of these fluctuations: there were 544,000 heavy skiers in 1982, 762,000 in 1983 -- 40 percent increase from 1982; 330,000 in 1984 -- 56.7 percent decrease from 1983; 660,000 (1985) -- an 100 percent increase from 1984, etc. These fluctuations make it more problematic to monitor and predict trends for downhill skiing. The fluctuations in the activity are most noticeable when the moving average statistics were examined. This statistic reveals smaller growth in the downhill skiing market during this period -- a small 2.9 percent growth in market size. On average, the heavy skier segment (those who ski 20 or more times per

year) accounts for only 9.4 percent of all skiers and 38.8 percent of all skiing days. The bulk of skiing is accounted for by the skier who skis 5 to 19 times per year. They comprise 37.9 percent of all skiers and 46 percent of all skiing days.

Northeast Trends. The Northeast downhill ski market was characterized by an increase in the number of skiers during the period of nearly nine percent. The overall market size more than double from 1982 to 1989 before declining to a low of 1.2 million in 1992 and then rebounding to 2.4 million in 1995 and 1996. Here again the moving average statistic is probably a better indicator of the changes in the activity for the region; however, this number also reveals moderate growth of over three percent increase in market size per year and 5.9 percent growth per year in market volume (skiing days). The Northeast share of all downhill skiers exceeded 44 percent in 1989. However, even though the market size and volume increased due to this surge in the late 80s, the average number of skiing days per skier in the region changed by only three percent. The number of skiing days per skier in the region remained around eight to nine days per year in the mid-90s.

The distribution of frequent and infrequent skiers in the Northeast is somewhat different from the national distribution. About 56.8 percent are frequent skiers and 43.2 percent are infrequent skiers in the Northeast in 1996 compared to 48.4 percent frequent and 51.6 percent infrequent at the national level in 1996. While both segments of the ski market in the Northeast appear to have grown substantially, this is largely due to the large increases in the 1988 and 1989 and in 1995 and 1996. The average annual increase for infrequent skiers in the region was 10.9 percent (3-point moving average change of 2.8 percent) and for frequent skiers, the average annual increase was 9.2 percent (a 3-point moving average change of 3.7 percent).

DISCUSSION

Trends are evident in these three recreational activities. Furthermore, more insights into an activity may be gained by examining carefully the regional and volume segments of the activity. National trends are not always reflected in the regional statistics. For example, in swimming, the trend changes were similar in some market conditions at the national and Northeast levels. However, the distribution of frequent and infrequent swimmers is different than the distribution at the national level. The difference between the distribution of frequent and infrequent markets was more distinct in the Northeast than at the national level. There was a higher proportion of frequent swimmers in the Northeast. Likewise the distribution of frequent skiers in the Northeast was much higher than the distribution at the

national level. Furthermore, the growth in the number of frequent skiers was more than double the rate of growth of this segment at the national level. Consequently, regional trends do not necessarily reflect national trends.

The market statistics do emphasize the need to monitor activities and participation volume carefully. It is probably equally important to examine local trends where possible to determine if there are further differences. Local "hot spots" may not reflect the national or even the regional trends.

The causes of these changes in activity user segments are still unknown. The trends were followed and documented here, but no specific reasons were given by responses as to why their interest has changed nor has the study population been continually studied such as in a panel study. Many questions are still unanswered. Why has the swimming market changed in both size and number of swimming days? For example, do distinct differences between heavy and light users exist? How do these markets differ both demographically and psychographically? How depended are activity trends on resource conditions? These data still do not address or answer these questions.

There is some evidence as to the factors that contribute to the decline or changes in activity participation. For example, one can see that the major reason swimming has rebounded in the Northeast is due to the increase in the frequent swimming market segment even though the average number of days per swimmer has actually declined slightly. Furthermore, a core group of swimmers, those who swim frequently, remains strong in the Northeast. In some years, the percent of frequent swimmers was as much as 10 percent higher in the Northeast than at the national level. Swimming still appears to have become a mature activity. There is no strong new influx of new swimmers, but a steady, growing market who desire to swim and who are swimming more frequently.

"Segmentation change" over time still continues to be an important issue which also must be addressed. People who participate in recreational activities often change their rates of play. It is very possible that people who in one year played an activity very frequently might the following year not play the activity nearly as frequently. There are numerous speculative reasons: poor resource conditions (i. e., no snow for snow skiing); climatic changes for weekend participation; changing social conditions (i.e., adult family members who find participation affected by the presence of young children in the household), etc. Perhaps even regional efforts regarding policy may impact activity rate change. This appears to be the case for hunting in the Northeast. The market size of the frequent hunting segment has increased the most. This may reflect

increased bag limits in game hunting in the Northeast. In the Northeast, the rate of growth for both infrequent and frequent hunters has been higher than the national rates in recent years. Although this growth appears to be one of more fluctuation than sustained growth. The moving average change rates does not reflect strong growth. There is actually a slight decline in the infrequent segment size when this statistic is used to monitor the growth here.

While there is limited understanding as to why such conditions exist, a recognition of the strengths and limitations of the Simmons Market Research Bureau's data must be also considered. First, the data are representative of the U.S. adult population and are consistently collected on an annual basis in the same manner. This provides the opportunity to conduct on-going trend analysis. Unlike other activity trend studies which were conducted at best every five to ten years and which often use different methods and questions, the data provided here were collected on an annual basis using the same format and procedures.

Nevertheless, the limitations to these data still exist. First, the data are only available in summary tables which limits any type of detailed statistical analysis. Data may be manipulated to examine selected segments as was the case in this review; but, individual case-by-case data are just now be made available by Simmons (1995 and 1996). Statistics are often provide in grouped format in tables. One must assume for example when calculating activity days that the midpoint of a group category is representative of the distribution of activity days in the category. Also, in open-ended categories, the low-end of the category must be used in activity day estimates as the category is not framed by an upper range limit. Consequently, the assumptions made here about activity day participation may actually be conservative and under-estimate the entire size of the activity demand. Furthermore, Simmons draws a new sample each year in their studies. They do not survey the same 20,000 individuals each year or conduct panel surveys to follow individual changes over time. Rather, they still project the market based on sample statistics. While there sampling procedures are highly sophisticated by stratification, weighting and over sampling techniques, there is the real likelihood that "sample bounce" may occur. "Sample bounce" is a condition where samples which reflect the true or actual mean of participation appear to fluctuate dramatically when presented over time. Sample means often cluster around the true mean of the population; however, there are times when a more distance or outlying mean represents the actual mean. The selection of certain sample means for each year may create a condition referred to as "sample bounce." It is possible to control sample mean estimates if more samples were

drawn; but, this is very costly especially with large national sampling techniques. These limitations still exist and must be noted. They are more likely to be encountered in longer periods of data review and analyses.

In recent years, Simmons has increased the upper levels of participation days involved in an activity. They have extend the levels to as high as 150 times per year. Such higher levels could distort the distribution of participation. However, in this study measures were taken to retain upper participation levels consistent throughout each of the years and more conservatively deal with these higher participation levels. One should note then that the estimated findings compiled here are likely more conservative than actual levels of participation volume.

Recreation participation patterns are complex, dynamic and not always easily understood. This review of three selected activities by volume segmentation within the context of one regional market area continues to shed new light on trend patterns. Simply following national trends can be misleading. A continued monitoring of recreational participation data should reveal additional insights over time.

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BELIEFS ABOUT NEW HAMPSHIRE, MAINE AND VERMONT WITH REGARD TO SELECTED TOURISM OPPORTUNITIES AND AMENITIES

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Abstract: A national survey has revealed that Americans believed that New Hampshire offers much of the following tourism amenities or opportunities: beautiful natural scenery, outdoor activities, sites of historical and cultural interest, safe environment for visitors and suitable accommodations. However, they also believed that among Maine, New Hampshire and Vermont, Maine offered the greatest number of amenities or opportunities related to beautiful natural scenery, outdoor activities, sea-related activities, river or lake-related activities, good food in restaurant and rural atmosphere. Vermont was ranked first with regard to winter activities and New Hampshire for friendly people and safe environment for visitors. Both Vermont and New Hampshire were believed to be the states that offered the greatest number of sites of historical and cultural interest. Maine and New Hampshire were both ranked first for shopping facilities.

Introduction

Tourism is one of the most important industries in New Hampshire; it had been estimated that tourism accounts for about 14 percent of the State's economy, and approximately 15 percent of employment. Because of the industry's importance there is widespread interest among various sectors in attracting visitors into New Hampshire. The State and the tourism industry would like to develop effective communication messages that will encourage tourists, especially those who have never been to New Hampshire before, to come. To develop effective messages, it is essential that the attitudes and beliefs of people about the State be determined. The information can then be used to better position New Hampshire in people's minds.

Because of its location and relatively small area, New Hampshire may be closely associated in people's minds with its northern New England sisters: Maine and Vermont. It is therefore important to know how New Hampshire is viewed in relation to its neighboring states. This information could also be useful in developing a market positioning strategy for

the State. In attracting visitors, it may be important for the State to highlight the attributes that it shares with these two states. There may be instances, however, when it would be appropriate for New Hampshire to communicate its qualities that are distinct from those of Maine and Vermont.

Methods

Information about American's beliefs and attitudes with regard to the three states was obtained through a mail survey. The mailing list, which contained 5,000 names, was purchased from a commercial vendor and represents a stratified random sample of the U.S. population that live outside New Hampshire.

The survey instrument contained questions designed to determine if the respondent had ever visited New Hampshire or New England, the respondent's beliefs as to tourism opportunities and amenities in the State, how the respondent ranked Maine, New Hampshire, and Vermont with regard to tourism opportunities and amenities, the attributes of a tourism destination that were important to the respondent, and the demographic characteristics of the respondent. The questionnaire and a cover letter were mailed in early April 1997. A refrigerator door magnet in the shape of the state of New Hampshire was enclosed with each questionnaire to encourage recipients to participate in the study. About three weeks later, another copy of the questionnaire and a cover letter were sent to those who did not respond to the first mailing. Six hundred thirty-eight usable responses were returned, for a response rate of 13 percent.

Rating of Tourism Opportunities and Amenities in New Hampshire

To determine the beliefs of Americans as to how much of selected tourism opportunities and amenities New Hampshire offers, respondents were asked to rate each opportunity or amenity on a seven-point scale. A rating of one indicates that the State offers very little of the opportunity and a rating of seven stands for "very much."

The percentage of respondents that assigned a particular rating for each opportunity or amenity was estimated. A close inspection of the data has revealed that the distributions of the ratings are unimodal and so the computation of a mean rating would yield meaningful results. The mean rating for each opportunity was then estimated. In interpreting the results a mean rating of four was considered to represent "average," and a mean rating of at least five was deemed positive or favorable. A mean rating that was below four was considered unfavorable. Table 1 shows the distributions and the means of the ratings.

New Hampshire received favorable ratings with regard to beautiful natural scenery, outdoor activities, winter activities, a safe environment for visitors, sites with historical and cultural interest, and suitable accommodations. Beautiful natural scenery received the highest average rating (6.1). Ninety-one percent of the respondents gave New Hampshire a rating of five or more; 46 percent gave a rating of seven. Outdoor activities also received a favorable rating (5.6). The highest percentage (31.2 percent) of respondents gave the

Table 1 Distribution of ratings indicating how much of selected tourism amenities/opportunities the state of New Hampshire offers

| Opportunity/Amenity | Rating | | | | | | | Sample Size | Rating |
|-------------------------------------|------------------|------|------|------|------|------|----------------|-------------|--------|
| | 1 Very little | 2 | 3 | 4 | 5 | 6 | 7 Very much | | |
| | Percent | | | | | | | | |
| Winter activities | 3.5 | 1.5 | 3.7 | 15.1 | 20.1 | 23.5 | 32.6 | 601 | 5.5 |
| Sea-related activities | 10.8 | 8.2 | 11.8 | 22.2 | 21.5 | 12.6 | 12.8 | 594 | 4.2 |
| River/lake-related activities | 3.2 | 3.7 | 9.3 | 26.0 | 25.2 | 18.4 | 14.2 | 599 | 4.8 |
| Golf facilities | 5.0 | 5.7 | 15.1 | 44.2 | 17.8 | 7.6 | 4.6 | 563 | 4.1 |
| Outdoor activities | 2.0 | 1.3 | 2.5 | 12.1 | 23.8 | 31.2 | 27.1 | 605 | 5.6 |
| Beautiful natural scenery | 1.1 | 0.7 | 1.1 | 6.2 | 13.0 | 31.5 | 46.3 | 615 | 6.1 |
| Historical and cultural interests | 1.6 | 2.6 | 8.6 | 20.9 | 21.2 | 23.7 | 21.4 | 608 | 5.1 |
| Nightlife/entertainment | 7.9 | 13.8 | 23.8 | 33.1 | 14.0 | 3.6 | 3.8 | 580 | 3.6 |
| Friendly people | 2.7 | 3.0 | 5.0 | 27.3 | 23.0 | 23.8 | 15.8 | 601 | 5.0 |
| Shopping facilities | 3.2 | 4.2 | 11.6 | 39.7 | 20.2 | 12.3 | 8.9 | 595 | 4.4 |
| Good food in restaurants | 2.7 | 2.4 | 7.4 | 32.2 | 24.7 | 18.4 | 12.3 | 594 | 4.8 |
| Family/children-oriented activities | 2.4 | 1.4 | 6.4 | 35.1 | 25.1 | 17.9 | 11.7 | 581 | 4.8 |
| Suitable accommodations | 2.0 | 1.2 | 4.0 | 26.8 | 29.5 | 22.7 | 13.8 | 596 | 5.0 |
| Safe environment | 1.0 | 1.0 | 2.8 | 19.6 | 20.9 | 34.0 | 20.7 | 603 | 5.4 |
| Cost of 1-week visit to NH | 0.6 | 1.3 | 7.4 | 27.3 | 38.7 | 18.4 | 6.1 | 618 | 4.8 |

State a rating of six. More than 82 percent assigned a rating of five or higher. The mean rating for winter activities was 5.5. The most common (32.6 percent) rating was seven; more than three-quarters of the respondents assigned a rating of at least five. A safe environment for visitors received a mean rating of 5.4. A rating of six was the one most frequently (34 percent) given by the respondents. Historical and cultural sites received a mean rating of 5.1; for this opportunity the mode was six. The mean rating for suitable accommodations was 5.0; this was also the most frequent rating (29.5 percent) for this opportunity.

New Hampshire was considered "average" as far as the following are concerned: river or lake-related activities, good food in restaurants, family and children-oriented activities, shopping facilities, sea-related activities, and golf facilities. The mean rating for river or lake-related activities is 4.8. More than half of the respondents gave a rating of five or higher. Good food in restaurants also received a mean rating of 4.8. The greatest proportion (32.2 percent) of respondents assigned this amenity a rating of four. About 55 percent gave a rating of at least five. Four was the most frequent (35.1 percent) rating for family and children-oriented activities, but more than half of the respondents rated the State at least a five for this opportunity. The mean rating was 4.8. The mean rating for shopping facilities was 4.4. About 41 percent of the sample gave a rating of five or more. Forty-seven percent of respondents gave New Hampshire a rating of at least five for sea-related activities. Close to 31 percent assigned a rating of three or lower; the mean rating was 4.2. Golf facilities received a mean rating of 4.1 and forty-four percent of the sample gave a rating of four.

The State received an unfavorable rating for nightlife and entertainment. The mean rating was 3.6 for nightlife and entertainment and 45.5 percent of the respondents assigned a rating of three or lower.

Belief as to Cost of a Vacation in New Hampshire

Cost is a major factor in many people's decision with regard to vacations and places to visit and so this study also aimed to know the beliefs of Americans about the cost of vacationing in New Hampshire. Respondents were asked to rate, using a seven-point scale, the cost of a one-week New Hampshire vacation, excluding the cost of travel from their home to New Hampshire and back. A rating of one stands for "not expensive" and a rating of seven means "very expensive." As indicated in Table 1, 38.7 percent of the respondents assigned a rating of five and 27.3 percent gave a rating of four. The mean rating was 4.8; this value is interpreted as representing "average" or at most "very slightly above average."

Ranking of Maine, New Hampshire and Vermont with Regard to Tourism Opportunities and Amenities

The survey also solicited opinions as to which state among Maine, New Hampshire, and Vermont offered the most of several tourism opportunities and amenities. Respondents were asked to rank the states from one to three, with one signifying that a state offered the most of an opportunity/amenity and a rank of three indicating that a state offered the least. The proportion of respondents who gave each state the top rank for each tourism opportunity/amenity was estimated. In this analysis, responses from residents of Maine and Vermont were excluded. The true proportion of

the population who believed that a state ranked first was inferred from the sample information. A 95-percent confidence interval was estimated for each sample proportion; this information was used in making conclusions as to

whether or not one state was ranked first for a particular amenity by more people than the other two states. The results are presented in Table 2.

Table 2 Percentage of Americans who believed that Maine, New Hampshire or Vermont offers the most of selected tourism opportunities

| Opportunity/Amenity | State | Point Estimate | 95% Confidence Interval |
|-------------------------------------|-----------------------|----------------|-------------------------|
| | | Percent | Percent |
| Sea-related activities | Maine | 93.0 | 90.8, 95.2 |
| | New Hampshire | 5.0 | 3.1, 6.9 |
| | Vermont | 2.0 | 0.8, 3.2 |
| River/lake-related activities | Maine | 48.4 | 43.9, 52.9 |
| | New Hampshire | 31.4 | 27.3, 35.5 |
| | Vermont | 20.2 | 16.6, 23.8 |
| Winter activities | Maine | 23.5 | 19.7, 27.3 |
| | New Hampshire | 21.2 | 17.6, 24.8 |
| | Vermont | 55.3 | 50.9, 59.7 |
| Outdoor activities | Maine | 42.9 | 38.4, 47.4 |
| | New Hampshire | 24.5 | 20.6, 28.4 |
| | Vermont | 32.6 | 28.3, 36.9 |
| Beautiful scenery | Maine | 41.7 | 37.2, 46.2 |
| | New Hampshire | 25.7 | 21.7, 29.7 |
| | Vermont | 32.6 | 28.3, 36.9 |
| Historical & cultural interests | Maine | 26.6 | 22.6, 30.6 |
| | New Hampshire | 37.3 | 32.9, 41.7 |
| | Vermont | 36.0 | 31.6, 40.4 |
| Nightlife/entertainment | Maine | 38.1 | 33.5, 42.7 |
| | New Hampshire | 28.9 | 24.6, 33.2 |
| | Vermont | 33.0 | 28.6, 37.4 |
| Shopping Facilities | Maine | 38.7 | 34.2, 43.2 |
| | New Hampshire Vermont | 36.2 | 31.7, 40.7 |
| | Vermont | 25.2 | 21.2, 29.2 |
| Suitable accommodations | Maine | 33.5 | 29.1, 37.9 |
| | New Hampshire Vermont | 30.8 | 26.5, 35.1 |
| | Vermont | 35.7 | 31.2, 40.2 |
| Family/children-oriented activities | Maine | 37.5 | 32.9, 42.1 |
| | New Hampshire | 31.7 | 27.3, 36.1 |
| | Vermont | 30.8 | 26.4, 35.2 |
| Good food in restaurants | Maine | 59.0 | 54.4, 63.6 |
| | New Hampshire | 20.9 | 17.1, 24.7 |
| | Vermont | 20.0 | 16.3, 23.7 |
| Rural atmosphere | Maine | 39.7 | 35.2, 44.2 |
| | New Hampshire | 30.9 | 26.7, 35.1 |
| | Vermont | 29.4 | 25.2, 33.6 |
| Friendly people | Maine | 29.3 | 25.0, 33.6 |
| | New Hampshire | 44.1 | 39.4, 48.8 |
| | Vermont | 26.5 | 22.3, 30.7 |
| Tourist-friendly services | Maine | 39.0 | 34.3, 43.7 |
| | New Hampshire | 31.3 | 26.8, 35.8 |
| | Vermont | 29.6 | 25.2, 34.0 |
| Safe environment for visitors | Maine | 34.0 | 29.5, 38.5 |
| | New Hampshire | 44.8 | 40.1, 49.5 |
| | Vermont | 21.2 | 17.3, 25.1 |

Statistical inference has revealed that the highest proportion of Americans gave the top rank to Maine for the following: sea-related activities, river or lake-related activities, outdoor activities, beautiful scenery, good food in restaurants, and rural atmosphere. For each of these opportunities or amenities, the lower confidence limit for Maine is greater than the upper confidence limit for the other two states. For example, for river or lake-related activities, the lower confidence limit for Maine is 43.9, which is greater than the upper confidence limit for New Hampshire (35.5) or for Vermont (23.8). It may be concluded therefore that, with 95 percent confidence, the proportion of Americans who ranked Maine number one with regard to this opportunity was greater than the proportion that ranked either of the other two states as number one.

Vermont received the most number-one rank for winter activities. Inferential analysis suggests that more than half of Americans believed that Vermont offer the most of this opportunity. The results also indicate that it is plausible that the proportions for Maine and New Hampshire were similar. The confidence interval for Maine (19.7, 27.3) contains values that lie within the confidence interval for New Hampshire (17.6, 24.8).

New Hampshire was ranked first by the most people for friendly people and safe environment for visitors. The confidence interval estimates show that at least 39.4 percent of the U.S. population believed that New Hampshire offered the most of the "friendly-people" amenity. For "safe environment for visitors," the 95 percent confidence estimates indicate that Americans ranked Maine second and Vermont third.

It appears that both New Hampshire and Vermont were ranked first with regard to sites of historical and cultural interest. Maine and New Hampshire were both ranked first for shopping facilities.

All three states were essentially ranked equally as to the following opportunities or amenities: suitable accommodations, family or children-oriented activities, and tourist-friendly services. Finally, it is difficult to say which state received the most number-one rank with regard to nightlife or entertainment. Maine received the highest number of "ones", however, the 95 percent confidence interval values indicate the possibility that the true proportion for Maine might be similar to the true proportion for Vermont, which received the second highest number of number-one rank. But it is also plausible that the population proportion for New Hampshire might be similar to Vermont's. It is clear however, that the proportion of Americans who believed that Maine offered the most opportunities for nightlife or entertainment was higher than the proportion who gave New Hampshire the top rank.

Conclusions

Many Americans have very favorable beliefs about tourism opportunities in Maine. Although New Hampshire was rated favorably on certain amenities when the state was evaluated apart from the other two states, it was not ranked first on these amenities when all the three states were considered simultaneously. Specifically, by itself, New Hampshire was rated highly on beautiful natural scenery, outdoor activities, winter activities, a safe environment for visitors, sites of historical and cultural interest, and suitable accommodations. However, when all three states were considered, New Hampshire was ranked first only for safe environment for visitors and tied for first with Vermont for historical and cultural interest sites. It ranked second behind Maine for beautiful natural scenery and outdoor activities, and second behind Vermont for winter activities. Furthermore, there are certain opportunities, such as river or lake-related activities and shopping facilities, that many Americans do not realize are plentiful in New Hampshire. The results suggest that New Hampshire should continue to promote itself nationally and, in its tourism promotion efforts, to highlight specific amenities or opportunities that visitors can expect to enjoy when they come and visit the Granite State.

1997 GENERAL PUBLIC RECREATION SURVEY FOR ONONDAGA COUNTY PARKS

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Abstract: This study was conducted for Onondaga County Parks. At the end of May, 1997 a general recreation survey was created and sent to 1500 residents of Central New York. One thousand surveys were mailed to randomly selected residents of Onondaga County, and 500 were mailed to randomly selected residents of Oswego, Cayuga, Cortland, and Madison Counties. A 32% response rate was received. Seventy-five percent of those responding were classified as park users. When given a choice, fees were chosen over taxes as the funding source for projects.

Problem Statement

Outdoor recreation space is increasingly necessary and desirable as a release from urban tensions and as an outlet for the creative use of leisure time (Hanmer, 1974). The natural landscapes, urban parks and historic resources shape the way we spend our leisure time (N.Y. DEC & OPRHP, 1994). The quality and character of the lives of the people of New York depend upon the quality and character of the land.

Based on recreation participation, public recreation providers have to decide on facilities and personnel. Resource managers must decide on the best mix of access, sites, and amenities. Do such factors as age, gender, income and education identify those most likely to engage in particular activities? Is participation in an activity growing, declining, or remaining relatively stable? And most important for those deciding on investments, what are likely future trends (Kelly 1987)? All of this information is critical because parks and recreation facilities contribute significantly to the economic stability of a state (President's Commission, 1986).

This study was created in response to a request by Onondaga County Parks. The Strategic Plan for Onondaga County Parks (OCP) outlines the following goals: (1) to increase customer satisfaction each year through 1999, and (2) to increase the revenue generated by public and private sources by 5% through that same year.

Onondaga County Parks consist of 12 facilities: a zoo, a nature center, a fish hatchery, a park, two beaches, two museums, three natural areas for hiking, and a minor league baseball stadium. Over the years, numerous surveys have been conducted at individual Onondaga County Parks and for specific park events. All of the results have shown a high approval rating of Onondaga County Park events, and the facilities in general. As recent as 1996, two separate visitor surveys were conducted at Burnet Park Zoo and Beaver Lake Nature Center (Bowes, 1996; Kortright, 1996). These surveys showed visitor support of both facilities. However, if Onondaga County is to reach its strategic planning goals, it must determine what are the recreational needs of its residents and not just park visitors.

Methods & Procedures

The objectives of this study were based on the by goals of the OCP Strategic Plan, and discussion with Commissioner Geraci. The study objectives were as follows:

- 1) Determine the percentages of the user and non-user types from the sample populations,
- 2) Determine the opinions of the sample populations on key issues,
- 3) Determine the preferred recreational activities for residents of the region,
- 4) Determine what recreational facilities are needed,
- 5) Determine reasons for being a user or non-user,

The Central New York General Public survey is a combination of the SCORP 1991 survey, NY States 1994 Visitor Survey, input from the County Commissioner of Parks, the Director of Recreation, and superintendents from each park.

The specific questions that this study attempts to answer are:

- Which recreational activities do Central New Yorkers partake in?
- Which activities do Onondaga County Park users partake in at an Onondaga County Park?
- What is the user and non-user opinion of Onondaga County Parks?
- What is the user and non-user opinion on specific recreational issues?
- How do the user and non-user feel towards fees?
- How do the user and non-user feel their tax dollars should be spent?
- What recreational services or accommodations are important to the user and non-user?
- What recreational facilities are needed in the user and non-user area?
- What are the user and non-user reasons for not visiting the parks?

Most questions allowed for an *other* category, permitting the respondent to express additional ideas or comments. These answers were grouped into categories to allow similar ideas or comments to be counted together.

To obtain both non-user and user information a mail survey was used to reach this target audience. It was determined to be the more efficient and, therefore, the more economical method of surveying (Salant & Dillman, 1994). Additionally, respondents control question pace and sequence and an interviewer is not present to influence particular answers.

To minimize coverage error, *Phonedisc* was selected as the software package to use in deriving the addresses because of its reputation as being the most complete phone and address directory available. The population to reach was Central New York and randomly selected residents of Onondaga, Oswego, Madison, Cayuga, and Cortland County. Using *Phonedisc* most residents of these Counties had an equal chance of being selected, therefore, coverage error was minimized (e.g., some households do not have a telephone or the number is unlisted).

This project surveyed 1500 Central New York residents: 1000 in Onondaga County, 125 in Oswego County, 125 in Cayuga County, 125 in Madison County, and 125 in Cortland County. These residents were randomly selected using a telephone and address software package *Phonedisc* for the Macintosh.

One hundred and 12 surveys were returned completed with the first mailing in June 1997. A reminder postcard was mailed ten days after the survey was sent. An additional 190 surveys were completed and returned. Ten days from this mailing a new cover letter and another copy of the survey was sent. This last mailing returned 110 completed surveys for a total of 412 and a return rate of 32%.

Statistics for most of the questions were categorized by four population groups:

- 1) = Non Onondaga County residents who are Onondaga County Parks users.
- 2) = Onondaga County residents who are Onondaga County Parks users.
- 3) = Non Onondaga County residents who are Onondaga County Parks nonusers.
- 4) = Onondaga County residents who are Onondaga County Parks nonusers.

Using SPSS/PC + the frequency and mean statistics were determined for each question. To compare the mean of each population group, statistics were calculated for the majority of these questions. This was done to see if there were any differences between these four populations mean ratings of the questions.

Results

The results of this project show that of the completed, returned surveys, 73% of the respondents classified themselves as Onondaga County Parks users. Central New Yorkers listed walking, picnicking and relaxing in a park, and visiting nature areas and zoos as the recreational activities that they participated in most, while more intense and active sports like tennis and mountain biking were least often reported (Table 1)

Table 1. Recreational Activities of Central New Yorkers 1997

| Activity | Percentage |
|-----------------------------|------------|
| Walking | 77% |
| Picnic/Relax in park | 71% |
| Gardening | 61% |
| Nature Areas | 54% |
| Swimming | 53% |
| Visit Zoos | 53% |
| Visit Historic Sites | 51% |
| Golfing | 41% |
| Bicycling | 39% |
| Fishing | 35% |
| Boating With A Motor | 30% |
| Hiking | 30% |
| Camping | 29% |
| Jogging/Running | 22% |
| Team Sports | 20% |
| Basketball | 20% |
| In-Line Skating | 19% |
| Cross Country Skiing | 18% |
| Boating Without A Motor | 17% |
| Ice Skating | 16% |
| Hunting | 16% |
| Downhill Skiing | 15% |
| Tennis/Handball/Racquetball | 14% |
| Mountain Biking | 11% |

Respondents were asked to indicate how much they agreed or disagreed with the statement: The following services and accommodations are important to me when I use a park facility. Respondents used the following 5 - point likert scale: 5= Strongly Agree; 4 = Agree; 3 = Not Sure; 2= Disagree; and 1 = Strongly Disagree.

Using the same services and accommodations as in Figure 1, respondents were asked to rank the importance of each. Using the ranking of 1 - 13, with 1 being the most important and 13 being the least. Figure 2 shows the total percentage of the top 3 ranking for each service/accommodation. Restrooms were seen as most important, followed by picnic areas, self-guiding brochures, and public telephones (Figure 2).

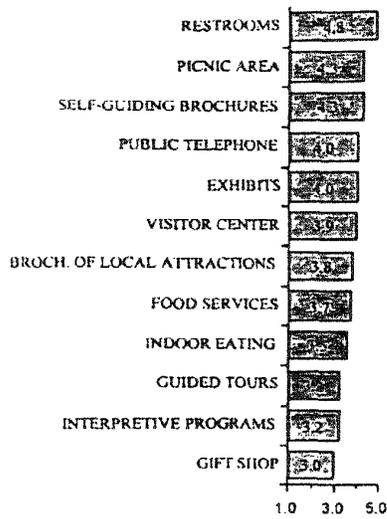


Figure 1. Importance Rating For Services and Accommodations

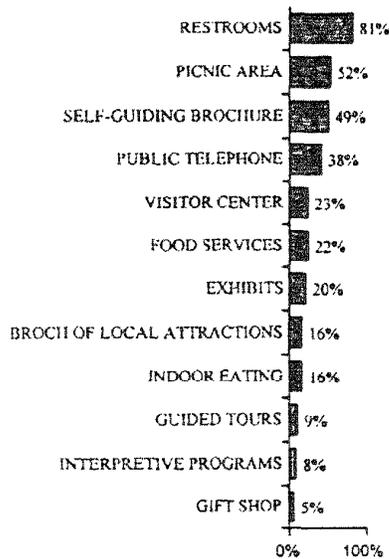


Figure 2. Importance Ranking For Services and Accommodations

This survey asked preferences concerning Onondaga County Parks development and, if these ideas were to be done, how would the respondent wish to pay for them (Table 2). There was support for Onondaga County Parks

increasing spending to maintain outdoor recreation facilities (53%), acquiring more land to preserve open space (50%), acquiring more parks (49%) and funding new recreational programs (46%). Though percentages are close, support was highest with spending to just maintain the existing facilities. Acquiring land for open space was slightly higher than acquiring additional land for more parks. When given the choice of how these ideas should be funded, paying by fees was preferred. Respondents were also in support (65%) of Onondaga County parks seeking private sponsorship to finance some of the parks' activities. When asked if Onondaga County Park fees were at an appropriate level, 45% agreed. The results seem to show that people are willing to pay with fees. This is consistent with National Park surveys results (Associated Press, Herald Journal 2/27/98).

Onondaga County Residents/Onondaga County Parks Non-user, showed the lowest mean scale score and support (of the four population groups) for Onondaga County Parks operating facilities such as nature centers, historical sites and zoos. They were the strongest supporters of Onondaga County Parks seeking sponsorship to finance some activities. This population also showed the lowest support for non-residents paying the same fees to use Onondaga County Parks as Onondaga County residents. Grouping the responses of these three statements might show a negativeness towards tax dollars for Parks. In the very least, this population has strong opinions on where their tax dollars should go. But still the majority support Onondaga County Parks.

Respondents agreed strongly with the following statement: Recreation opportunities are an important fact in the quality of life in Central New York (91%). Respondents felt Onondaga County Parks should own facilities such as zoos, nature centers, and historical sites (75%). Additionally, keeping the existing parks well maintained (71%) and cleaned (72%) were also seen as important.

Respondents felt that Onondaga County Parks' programs were primarily oriented for families (58%). Only 24% felt that there was enough programs for senior citizens, 12% felt there was enough programs for youths, and only 10% felt there was enough programs for adults.

Respondents were asked whether they felt certain facilities were needed in their area (within a 30 mile radius from their home). Onondaga County Parks Users felt more facilities were needed, as compared to a lower percentage of the other 3 population groups. High on this preference list were bike and skate trails (50%), hiking trails (46%) indoor athletic center (42%), and an indoor aquatic center (41%). Camping facilities was seen as needed by Non-County Residents/ Onondaga County Park Non-user (52%).

The main reasons respondents gave for not using Onondaga County Parks were not enough time, using facilities closer to home and not enough information.

Table 2. Onondaga County Park Issues And Their Funding

| Question/Statement | Response | Total Population |
|---|----------|------------------|
| <i>More Lands should be Acquired by Onondaga County To Preserve Open Space</i> | | |
| Should This Be Done | Yes | 50% |
| Should This Be Done | Not Sure | 34% |
| Should This Be Done | No | 16% |
| Would You Pay For It By Fees | Yes | 84% |
| Would You Pay For It By Taxes | Yes | 69% |
| Would You Pay For It By Fees | No | 31% |
| Would You Pay For It By Taxes | No | 16% |
| <i>More Parks Should Be Acquired By Onondaga County For Recreation</i> | | |
| Should This Be Done | Yes | 49% |
| Should This Be Done | Not Sure | 35% |
| Should This Be Done | No | 17% |
| Would You Pay For It By Fees | Yes | 87% |
| Would You Pay For It By Taxes | Yes | 62% |
| Would You Pay For It By Fees | No | 38% |
| Would You Pay For It By Taxes | No | 13% |
| <i>There Should Be an Increase in Spending By Onondaga County To Maintain Outdoor Recreation Facilities</i> | | |
| Should This Be Done | Yes | 53% |
| Should This Be Done | Not Sure | 33% |
| Should This Be Done | No | 14% |
| Would You Pay For It By Fees | Yes | 85% |
| Would You Pay For It By Taxes | Yes | 71% |
| Would You Pay For It By Fees | No | 30% |
| Would You Pay For It By Taxes | No | 15% |
| <i>New Recreational Activities And Programs Should Be Funded In Onondaga County</i> | | |
| Should This Be Done | Yes | 46% |
| Should This Be Done | Not Sure | 36% |
| Should This Be Done | No | 18% |
| Would You Pay For It By Fees | Yes | 93% |
| Would You Pay For It By Taxes | Yes | 67% |
| Would You Pay For It By Fees | No | 33% |
| Would You Pay For It By Taxes | No | 7% |

The open comment section at the end of the survey had responses that ranged from cleaning up Onondaga Lake to building an aquatic club for Onondaga County residents. High satisfaction with Onondaga County Parks was the comment most often written.

Discussion

In summation, the findings show a high support of Onondaga County Parks. Respondent want existing facilities kept clean and well maintained. Acquiring new land had highest support if doing so purely for open space.

Onondaga County Parks programs that target to families are successful. Some respondents did not feel that enough programming is done specifically for adults, youths, or senior citizens. Additional advertising, such as mailing park brochures, might make residents more aware of all park programs.

Overall, as a funding choice fees seem to be well accepted and this seems to be consistent with other government

findings. Of all the issues, fees had the highest support when it came to activities and programs. This would seem to imply that users should pay. It is important to note here, however, that with each spending issue, paying with taxes was also acceptable to many residents.

For the most part, Onondaga County Residents/Onondaga County Parks Non-users were supportive of Onondaga County Parks or held a high opinion of the Parks Department. There is room to increase this population's support. However, Onondaga County Parks seems to be heading in the right direction - with high user and non user support.

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Recreation Modeling



INFLUENCING HUMAN BEHAVIOR THROUGH PERSUASIVE COMMUNICATION: APPLICATIONS OF THE ELABORATION LIKELIHOOD MODEL IN RECREATION RESOURCE MANAGEMENT

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Abstract: This paper examines the application of the Elaboration Likelihood Model with its persuasive communication techniques in the field of recreation resource management. The use of persuasive communication can aid in influencing attitudes and behavior, which can be beneficial in raising public awareness and getting public compliance with management regulations. The Elaboration Likelihood Model is a useful framework for assessing the strength of the persuasive message and determining if the message is appropriate for its attended audience. This can benefit resource managers by increasing favorable attitudes, and thus behavior, toward rules, safety, resource ecology and protection.

Introduction

In the field of recreation resource management it is often thought that educating the public about the "facts" surrounding a circumstance or decision will be enough to convince the public that management agencies have employed the best solution to the problem at hand. This is, however, not always found to be true. Generating support for rules or regulations is often not a simple matter of explaining to recreationists the need to limit ecological impacts, for example. A backpacker seeking solitude may knowingly violate regulations by trespassing in a closed recreation area not believing the impacts he or she creates are significant. Management agencies often expect the public to follow management prescriptions based on facts readily accepted by managers, in a language that is primarily understood by, and is relevant to these same managers. What does not occur, unfortunately, is a meaningful attempt to persuade users or the public to accept the management position being advocated in a language they understand and accept. By communicating and effectively delivering a relevant message explaining reasons for a particular position on a particular topic, the public may become more inclined to understand and respect the recommendations issued by management professionals. Perhaps there would be greater support for programs, rules and regulations if the public understood

their importance, as well as the possible recreational and economic benefits that result from their appropriate participation in an activity.

The effectiveness of persuasive communication has shown to be applicable in a variety of recreation management issues, including efforts to limit resource impacts, reduce depreciative or deviant behavior, avoid and solve visitor conflicts, and to avoid hazards. A successful campaign to initiate attitude change can result in more desirable and safer behaviors among recreationists. However, persuasive attempts to influence public attitudes and behavior often fail because of the manager's weak understanding of the persuasive process. To accomplish a successful persuasive campaign, there must be more emphasis on understanding the fundamental psychological processes that lie within the framework of persuasion theory.

There are many frameworks that can be used to theoretically analyze the effectiveness and to explain the processes responsible for attitude change (the result of effective communication). The Elaboration Likelihood Model is one such framework for persuasive communication (Petty and Cacioppo 1981, 1986a, 1986b). This model, in particular, may prove more useful to recreation managers because not only does it specify the conditions under which persuasion should be mediated by message-related thinking, but it also postulates that there are peripheral mechanisms that account for persuasion when the recipient is unable to scrutinize the persuasive message. A successfully communicated persuasive message is one that considers the audience's ability to process the message, as well as the message source, content, timing, and audience characteristics (Roggenbuck 1992).

Persuasive Communication

The term "attitude" refers to a general favorable, unfavorable, or neutral evaluation of a person, object, or issue, while "persuasion" refers to any effort to modify an individual's evaluations of people, objects, or issues by the presentation of a message. The nature of persuasive communication is to use verbal messages to influence attitudes and behavior. These verbal messages are designed, through a process of reasoning, to influence the receivers to change their mind. The message must consist of three parts, an advocated position, arguments in support of the advocated position, and factual evidence that supports the general arguments. The success of persuasive communication is measured by whether the attitudes of the recipients are modified in the desired direction, and whether their attitudes in turn influence their behavior.

The Elaboration Likelihood Model (ELM) of persuasion emphasizes two possible routes of processing messages that contain the persuasive information. These routes are the central route and the peripheral route. Central route processing involves the ability and motivation to process the information by drawing upon prior experience and knowledge to evaluate the arguments presented in the message. The resulting attitude is one that has been integrated into the receiver's belief structure. Attitudes formed by the central route are predictable, relatively

accessible and stable over time until they are challenged by convincing counter-arguments (Petty and Cacioppo 1986b). The peripheral route, in contrast, involves low ability or motivation to process the relevant arguments presented in the message, and attitude change occurs when simple cues influence attitude (Petty and Cacioppo 1986a, 1986b). Messages containing the persuasive arguments are passively accepted and have a less articulated cognitive foundation. Attitude change through the peripheral approach is usually short-term and tends to be less accessible.

There are several variables that affect a person's motivation and ability to process the information contained in the message. One includes personal relevance (Petty and Cacioppo 1986a). People are more interested in thinking about messages that are perceived to have direct personal relevance. However, the motivation to think about the arguments in the message may provoke the receiver to generate counter-arguments that contradict the desired change in attitude, especially if the argument is specious or weak. This can be prevented by increasing the argument quality or strength expressed in the message. Not only is motivation necessary in processing information via the central route, but the ability to process the message is also important. If the message is long or complex, it may require more than one exposure to successfully process the information, even if the receiver is highly motivated. The increased processing should generate more favorable thoughts and attitudes if the arguments are strong. However, if the arguments are weak, or not well supported, counter-arguments may develop and less favorable attitudes may result (Cacioppo and Petty 1989). Another variable that influences the ability to process information is distraction. If the source of the message talks too fast, the receiver may be distracted when thinking about the message. When the message contains strong arguments, such disrupted thinking will likely reduce persuasion. In contrast, when the message contains weak arguments, disrupted thinking should actually enhance persuasion by reducing the person's ability to generate counter-arguments (Petty and Brock 1981). Features of the persuasion situation may also influence the extent to which thoughts generated by a message are consolidated and stored in long term memory. For example, arguments that match a person's attitude schema are more easily incorporated into the existing cognitive structure than arguments that do not (Cacioppo, Petty, and Sidera 1982). Finally, certain variables that may serve as simple cues in the peripheral route when motivation or ability to process arguments is low include the credibility of the message source, how likable or attractive the source is, the number of arguments in the message, and the number of other people thought to endorse that particular position.

In the model, the term *elaboration* refers to the extent to which people think of issue-relevant arguments contained within the persuasive message. The ELM maintains that as the likelihood of elaboration increases, the perceived quality of the issue-relevant arguments presented becomes a more important determinant of persuasion, under this condition, the central route should be used. Conversely, as the elaboration likelihood decreases, variables that are

capable of affecting persuasion without affecting argument scrutiny, called peripheral cues, become more important and the peripheral route should be used (Petty and Cacioppo 1986b). The ELM also holds that when elaboration likelihood is high, such as when perceived personal relevance and knowledge is high, the message is easy to understand and no distractions are present, people usually are able to evaluate the arguments presented. Persuasive variables are likely to have less of a direct impact on evaluations by serving as simple peripheral cues in these situations. Instead, when the elaboration likelihood is high, a variable may serve as an argument if it is relevant to the merits of the issue (Petty, McMichael and Brannon 1992). However, when the elaboration likelihood is low, such as when personal relevance or knowledge is low, the message is complex, and there are many distractions, people are not able or do not want to process the arguments presented in the message. If evaluations are formed under these conditions, they are likely to result from simple associations or inferences based on salient cues (Petty et al. 1992). When the elaboration likelihood is moderate, such as when personal relevance and knowledge is uncertain, and the message is moderately complex, people may be uncertain as to whether or not the message warrants scrutiny and whether or not they are capable of processing the message. In these situations, they may examine the persuasion context for indications, such as the credibility of the source, to determine if they are interested in processing the message (Petty et al. 1992).

Because any one variable can produce persuasion in several ways, it is important to understand the process by which the variable influences a person's attitude. The ELM holds that the source of the message, message content, audience characteristics, and timing of the message can work by different processes in different situations. In addition, the central and peripheral route processes, by which the variable induces attitude change, are critical for understanding the consequences of the new attitude.

When an individual's attitude is changed, it is important that the new attitude guides behavior and not the old habits. Attitudes have a greater impact on behavior when the attitudes in question are consistent with underlying beliefs, when the attitudes are based on greater amounts of relevant information and/or personal experience, and when attitudes are formed as a result of considerable issue-relevant thinking. Furthermore, it is also important that cues in the situation indicate that a person's attitude is relevant to the behavior.

An individual can learn the intended information, but the acquisition of this knowledge does not invariably mean that attitude and behavior will change as a result. A person will not be persuaded if he or she is unable to process the information, if the information is counter-argued, or if the information is considered personally irrelevant (Petty et al. 1992). Information will succeed in producing lasting changes in attitudes and behavior only if the individual is motivated and able to process the information in the message, and if the processing results in favorable cognitive reactions (Petty and Cacioppo 1981, 1986a). Once attitudes have been changed, the implementation of

changing behavior may require learning new skills and perceptions of self-efficacy.

If the goal of a persuasion-based program is to produce long-lasting changes in attitudes with behavioral consequences, the central route to persuasion appears to be the more important strategy. If the goal is immediate on-site formation of a new attitude, the peripheral route may prove acceptable.

Application to Recreation Resource Management

-Reduction of Resource Impacts and Visitor Conflicts

Recreation activities cause changes in the environment, impacting wildlife, vegetation, soils, and water flow and quality. While many visitors and resource managers are concerned about these impacts on the natural systems, to what extent depends largely on individual perceptions and preferences, as well as the mandated purpose and managerial goals of the area. Management concerns about these impacts include resource degradation which can make an area less attractive or desirable to recreationists, deviant behavior including littering, vandalism and trampling, and the resulting increased costs of maintenance and restoration projects. Both central and peripheral routes of persuasive communication can be used to construct messages that educate visitors on environmental sensitivity, solve conflicts among visitors to recreation areas, and even alter perceptions of crowding and resource impacts in park settings (Roggenbuck 1992). Which route managers should use depends on the recipient's attention and ability to process the persuasive message.

It is important to know when a message is more likely to be processed either by the central or peripheral route of processing, since each accomplishes tasks differently depending on the recreation setting, audience and problem. If the message is to instill a greater environmental ethic among recreationists, the central route would be more appropriate because it integrates new beliefs or changes old beliefs, resulting in a more stable behavior change (Roggenbuck 1992). The central route may also prove more successful when dealing with unintentional deviant or depreciative behavior. Godin and Leonard (1979) maintain that inappropriate behavior in wildland areas are mostly unintentional and are often the result of ignorance. Information or simple education may be all that is necessary when the undesirable behavior is a result of lack of knowledge or awareness of the regulations. A successfully communicated persuasive message will promote a shifting away from depreciative behavior, with the decision to not engage in such behavior becoming self-determining (Knopf and Dustin 1992). Timing of the message is also important for managers who may wish to promote recycling programs and alternative trail usage (Roggenbuck 1992). Placing recycling containers throughout recreation service areas, and delivering trail information before hikers reach trailheads, will allow people to make decisions at the proper time.

Peripheral route processing may prove more successful if the learning environment is distracting, or if the receivers are unable to integrate the issue-relevant argument into their belief system. In a situation where depreciative

behavior is intentional, this route may be more likely to induce the desired behavior. This route relies on externally imposed compliance mechanisms, including direct coercion (Knopf and Dustin 1992). Peripheral route processing can prompt behavior change, but since it does not use issue-relevant reasons for behavior, it does not produce long-term behavior change unless the peripheral cue is present (Roggenbuck 1992). Once the peripheral cues are removed, the propensity for undesirable behavior returns.

-Increasing Awareness of Hazards in Recreation Settings

Effectively communicating the need to be aware of hazards and to take precautions against injury or death is of great importance to recreation managers. Important elements to consider in constructing persuasive messages to reduce risks include which message content will be most effective in eliciting the appropriate behavior, what sources will be perceived as most credible by the receivers, and what channel will be most effective for producing high acceptance of the message. Again, it is important to determine which route the message is most likely processed through. This will depend on how hazards are perceived by recreationists and the availability of alternatives for reducing potential risks. If perceptions about hazards are accurate and if alternatives for reducing risk of injury are also perceived as beneficial, then recreationists may be more inclined to engage in risk-reducing behaviors (McCool and Braithwaite 1992). However, McCool and Braithwaite (1992) maintain if perceptions are inaccurate and alternatives are not perceived as reducing risk, then recreationists are less likely to engage in risk-reducing behaviors. Therefore, administering a persuasive communication program should prove useful in altering misperceptions of hazards, and promoting changes in inappropriate behavior. Constructing messages that use the central route might prove more beneficial in situations involving reduction of risks because it is the central route that results in enduring attitude shifts and behavioral changes. However, state and federal land management agencies responsible for managing occupied grizzly bear habitat, for example, currently employ a persuasive communication program that delivers a peripheral message designed to produce attitudinal change (McCool and Braithwaite 1992).

Management Implications

The process responsible for attitude change can be considered in the framework of the Elaboration Likelihood Model (ELM). The ELM indicates that variables can serve as persuasive arguments, peripheral cues, or affect argument processing. Variables that influence the success rates of persuasive communication include the message content, its timing, recipient characteristics, and message source. Successful persuasive communication depends on whether attitudes are modified in the desired direction and whether attitudes, in turn, influence behavior (Petty, McMichael, and Brennan 1992).

Persuasive communication can benefit recreation resource managers by increasing knowledge, favorable attitudes, and behavioral intentions about rules, safety, resource ecology, and protection. Since many recreation activities are associated with, or are in areas that are managed by natural

resource agencies, those who participate in such activities are greatly affected by the outcomes of management decisions. These activities are often large entities responsible for spending millions of dollars on equipment and/or associated expenditures, often stimulating many local economies as well as driving federal conservation programs. It should then seem obvious to suggest that natural resource managers, and recreation agencies and interest groups combine efforts to challenge opposition to management decisions viewed as adverse to their goals. Nevertheless, the persuasive measures discussed here have clear implications for recreation resource management agencies and their attempts to influence beliefs, attitudes and associated behaviors.

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RECREATION PARTICIPATION AND SCENIC VALUE ASSESSMENTS OF CLEARCUTS

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Abstract: Four broad patterns of forest recreation activity are identified among residents in northern New Hampshire: campcraft, studying, motorized and prey. Each group assesses differently the recreation opportunity from clearcutting. Both recreation participation and anticipated opportunity have significant effects on the scenic value of harvested views. Trends in recreation participation indicate greater future sensitivity of harvesting activity.

Introduction

Our National Forest lands are mandated to provide for multiple uses. This mandate has not changed as the Forest Service seeks to reinvent itself and its management approach through "New Forestry" or sustainable forestry. This leaves forest managers with the same dilemma they have faced since the late-1960's, how to provide for recreation and scenic benefits, as well as, timber harvesting. This conflict has become particularly acute on Northeastern forests, such as the White Mountain National Forest. The recreation use of forest lands is ever increasing, since they are within a modest drive of major metropolitan centers. At the same time expectations have risen for increased timber production because of harvesting restrictions in other parts of the country.

This paper investigates the link between recreation participation and the perceived scenic value associated with clearcuts. The larger goal is a contribution to our understanding of how broad patterns of perceptions about timber management activities may shift as recreation patterns shift. The paper begins by identifying four distinct groupings of recreation activities that are engaged in by residents of New Hampshire's North Country. As Ditton (1975) explains, the reason to identify recreation typologies is that people "pursue a rather distinctive outdoor recreation pattern ... and this knowledge simplifies the task of relating people to recreation resources." Surveyed regional opinion leaders and Forest Service employees are also classified as displaying, or not, each of these four recreation patterns. Then analysis of variance is used to determine whether those participating in each recreation type differ from the others in how they rate the scenic value, and their assessment of how clearcutting effects recreation opportunity.

Methods

The general model for this paper is shown in figure 1. The study respondents, who represent different groups interested in forest management, react to visual simulations

of clearcutting scenarios and evaluate their scenic value. This paper particularly focuses on the influence that recreation participation has on the scenic ratings. Different types of recreationists also anticipate different effects on recreation opportunity from clearcutting. This in turn affects judgments of scenic value. Those interested in the details of the survey methods are referred to Palmer (1998).

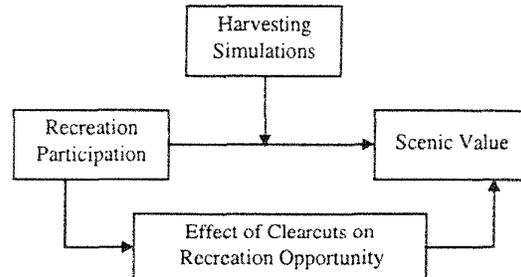


Figure 1. Heuristic model of the study design.

Visual simulations. Two viewpoints in the White Mountain National Forest were selected for assessment. Alternate scenarios that included three harvesting entries over a 35 year period were designed by the Forest's landscape architecture staff. The alternatives represent the 30 possible combinations of 3 attributes: (1) harvesting 3, 6, 9, 12 and 15 percent of the seen area, (2) using clearcuts that are 4-5, 10-14 or 20-30 acres, and (3) concentrating or distributing the clearcuts made at each entry. A control scenario without any visible harvest activity was also included. Color photo-realistic simulations of the 31 alternatives were prepared and printed for use with a survey questionnaire. Only the scenic value ratings of the two unharvested scenes, and the twelve scenes with 15 percent of the area harvested are used in this paper. The harvested scenes represent intensive sustainable scenarios for the White Mountain National Forest.

Surveys. Three distinct surveys were conducted for this study: (1) a random sample of residents from New Hampshire's North Country, (2) four groups of opinion leaders who influence forest policy: members of the North Country Council's advisory board, attendees at a meeting the Appalachian Trail Conference, and two state committees established to review forestry regulations, and (3) USFS employees stationed on Region 9 National Forests or districts: archeologists, engineers, foresters, landscape architects, rangers or forest supervisors, recreation specialists, and wildlife biologists.

Results

Patterns of recreation participation. Respondents from all three surveys characterized their participation in 18 recreation activities as frequently, occasionally, or never. An average linkage clustering algorithm is used to identify the affinity patterns among recreation activities found among the local residents (SAS 1994). The results are shown in figure 2 as a dendrogram of affinity among these activities. There are four broad patterns of forest recreation, shown in the shaded boxes. I characterize these as

camcraft, motorized, prey, and studying activities. Driving and walking for pleasure are almost universal among the respondents, so are not useful for distinguishing differences among respondents. Down-hill skiing is a high-tech sport like the motorized group, but involves some aspects of being with nature, like the camcraft group.

There are 7 camcraft activities. Three are chosen to represent the group because they are particularly common on national forests: backpacking, camping and canoeing. A respondent is identified with the camcraft group if they frequently participate in any of these three activities. Similarly, a respondent is identified with the motorized, prey, or studying groups if they frequently participated in one of the associated activities.

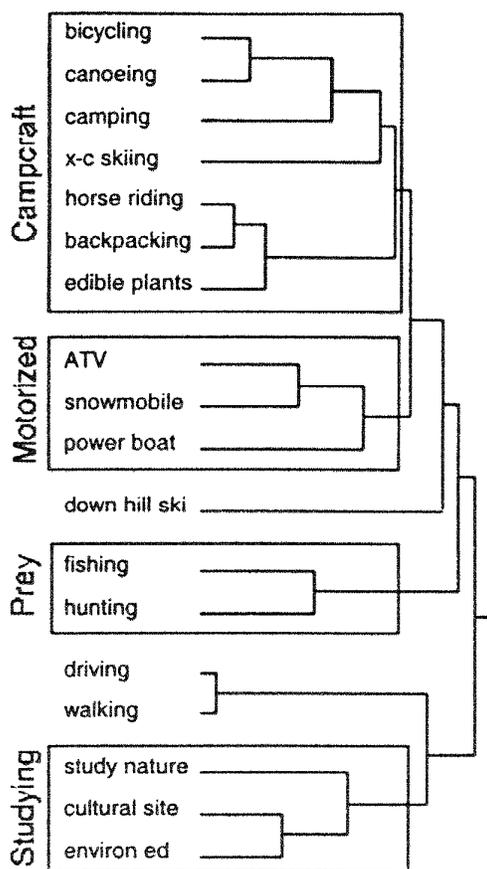


Figure 2. Recreation activities clusters based on frequency of participation.

Table 1 presents the percentage of local residents, opinion leaders, and USFS employees exhibiting each of these four patterns. There are similar percentages of camcraft and nature study recreationists in each of the three samples (chi-sq. = 2.9 and 1.5, $p = .24$ and $.48$ respectively). However, the opinion leaders are much less likely to participate in motorized (chi-sq. = 13.4, $p = .001$) or prey (chi-sq. = 13.5, $p = .001$) activities.

Table 1. Percentage recreationists in each sample.

| | Public | Leaders | USFS |
|--------------|--------|---------|------|
| Campcraft | 26.0 | 34.0 | 24.9 |
| Nature study | 45.5 | 54.6 | 49.8 |
| Motorized | 24.7 | 5.2 | 14.6 |
| Prey | 39.0 | 24.7 | 46.8 |
| sample size | 77 | 97 | 205 |

In preparing this paper, the relative influence of recreation activity pattern and survey group was evaluated. In general, there are no significant effects associated with the survey groups, while some interesting results are associated with the recreation patterns. Therefore the responses from the three surveys are combined for this paper.

Perceptions of scenic value and recreation opportunity. Each respondent rated the scenic value of two unharvested scenes, and twelve scenes with 15 percent of the view harvested over a 30 year period. The rating scale ranged from 1 for lowest to 10 for highest scenic value. Table 2 reports the mean scenic values for the unharvested and 15 percent harvested scenes for each pattern of recreation participation. There are no significant differences in scenic ratings for the unharvested scenes between the participants and non-participants in the four recreation patterns. This indicates that there is wide agreement concerning the high scenic value of these scenes. Nor are there significant differences between the camcraft and nature study participants and non-participants. However, both motorized and prey sports enthusiasts rate the harvested scenes higher than do non-participants of these activities.

The significant results may occur from either of two causes. First, it is possible that motorized and prey recreationists are less sensitive to harvesting impacts to scenic value. The results in table 2 indicate that participants and non-participants assign similar scenic value to the unharvested scenes. Therefore, the differences cannot be attributed to a scenic insensitivity among motorized and prey recreationists, *per se*. It just appears that they are more tolerant of scenic impacts from harvesting. The second possibility is that both groups see advantages from harvesting and that this influences their ratings. For instance, motorized recreationists may consider clearcut openings desirable when they are in the forest. Similarly, prey recreationists may believe that harvesting improves wildlife habitat and increases hunting opportunities.

Respondents also evaluated the effect of 5 to 30 acre clearcut patches on recreation opportunity. The rating scale for this impact ranges from 1 for very positive to 5 for very negative. Table 2 includes the mean anticipated impact of clearcutting on recreation opportunity by recreation participation. There are no significant differences between participants and non-participants in camcraft, nature study and motorized activities. However, prey recreationists anticipate significantly greater recreation opportunity in forests with clearcutting than do others.

Table 2. Mean scenic values and recreation opportunity assessment.

| | Mean | | F (p) |
|-------------------------------|-------|------|------------------|
| | Part. | Not | |
| <i>Un-harvested</i> | | | |
| Camcraft | 9.18 | 9.12 | 0.13 (.715) |
| Study | 9.11 | 9.17 | 0.13 (.721) |
| Motorized | 9.19 | 9.13 | 0.09 (.766) |
| Prey | 9.02 | 9.22 | 1.69 (.194) |
| <i>15% Harvested</i> | | | |
| Camcraft | 3.85 | 3.86 | 0.01 (.937) |
| Study | 3.77 | 3.72 | 0.90 (.345) |
| Motorized | 4.69 | 3.72 | 13.79 (.0002) |
| Prey | 4.30 | 3.57 | 15.45 (.0001) |
| <i>Recreation Opportunity</i> | | | |
| Camcraft | 3.07 | 2.91 | 2.07 (.151) |
| Study | 3.04 | 2.87 | 2.90 (.089) |
| Motorized | 2.81 | 2.98 | 1.47 (.226) |
| Prey | 2.75 | 3.09 | 11.9 (* .001) |

Note: Values in bold type are significant at the .05 level.

The effects of recreation participation, perceived recreation opportunity, and their interaction on the assessment of the scenic value of views with clearcutting are evaluated for each recreation group in the following sections. Analysis of variance (ANOVA) and covariance (ANCOVA) are the statistical methods employed. Plots of the regression line relating recreation opportunity to perceived scenic value for participants and non-participants are used to further interpret the results. In these plots, the highest recreation opportunity is 1 and the highest scenic value is 10.

Camcrafters' assessment. The results in table 3 indicate camcraft participation, recreation opportunity assessments and the interaction of the two are all statistically significant. There is a strong relation between camcrafters' ratings of scenic value and recreation opportunity ($r = -0.616$), as indicated by the steep regression line in figure 3. This relation is much weaker, though still very significant, for the non-participants ($r = -0.337$), which is the source of the significant interaction. Camcrafters participants that anticipate greater recreation opportunities from harvesting also have higher scenic value ratings than non-participants. On the other hand, if camcrafters find little opportunity from harvesting, they give lower scenic value ratings than non-participants.

Table 3. Effect of camcraft participation and recreation opportunity on scenic value of harvested views.

| Effect | F-value | Prob. |
|------------------------|---------|---------|
| Camcraft participation | 8.3 | .004 |
| Recreation opportunity | 87.6 | * .0001 |
| Interaction | 8.5 | .004 |

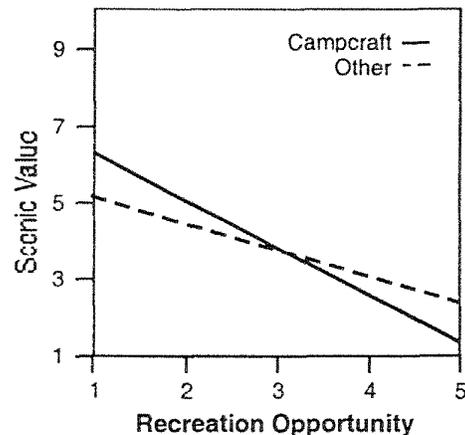


Figure 3. Camcraft recreationists and others evaluation of harvested scenic value and recreation opportunity.

Studiers' assessment. Whether respondents participated in study-oriented recreation activities did not affect their judgment of scenic value, as shown in table 4. This is indicated in figure 4 by the nearly identical regression lines. The significant effect of recreation opportunity on scenic value is a reflection of the relationship for the respondents as a whole ($r = -0.430$).

Table 4. Effect of study participation and recreation opportunity on scenic value of harvested views.

| Effect | F-value | Prob. |
|------------------------|---------|---------|
| Study participation | 0.3 | .614 |
| Recreation opportunity | 73.9 | * .0001 |
| Interaction | 0.5 | .484 |

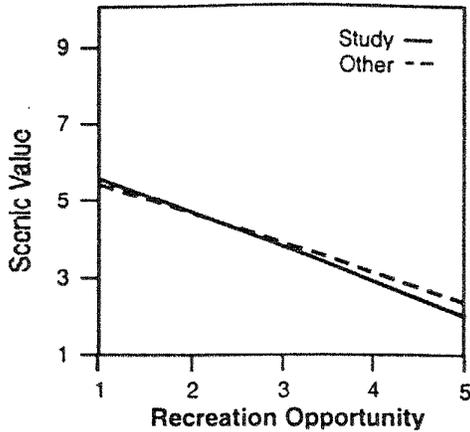


Figure 4. Study recreationists and others evaluation of harvested scenic value and recreation opportunity.

Motorers' assessment. Table 5 shows that participation in motorized recreation has a significant effect on scenic value judgments of harvested views. Assessment of recreation opportunity also has a very significant effect. The regression lines in figure 5 show this is true for both motorized recreationists ($r = -0.552$) and non-participants ($r = -0.399$). The significant interaction effect of participation and recreation opportunity is indicated by these two regression lines not being parallel. For any given level of recreation opportunity, motorized recreations are more likely to rate harvested views as more scenic.

Table 5. Effect of motorized participation and recreation opportunity on scenic value of harvested views.

| Effect | F-value | Prob. |
|-------------------------|---------|-------|
| Motorized participation | 10.3 | .002 |
| Recreation opportunity | 62.5 | .0001 |
| Interaction | 4.8 | .030 |

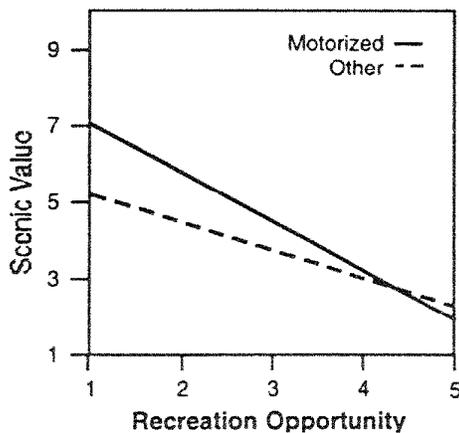


Figure 5. Motorized recreationists and others evaluation of harvested scenic value and recreation opportunity.

Prayers' assessment. Though less pronounced, the analysis for prey recreationists is similar to motorized recreationists. Table 6 shows that participation in prey sports has a significant effect on scenic value, as does anticipated recreation opportunity. The regression lines in figure 6 show that the relation between scenic value and recreation opportunity is strong for both participants ($r = -0.492$) and non-participants ($r = -0.354$). The interaction term is only just above the traditional cut-off for statistical significance (i.e., $p = 0.05$). However, for a given assessment of recreation opportunity, prey recreationists are likely to give higher scenic value ratings.

Table 6. Effect of prey participation and recreation opportunity on scenic value of harvested views.

| Effect | F-value | Prob. |
|------------------------|---------|-------|
| Prey participation | 5.8 | .016 |
| Recreation opportunity | 73.2 | .0001 |
| Interaction | 3.7 | .056 |

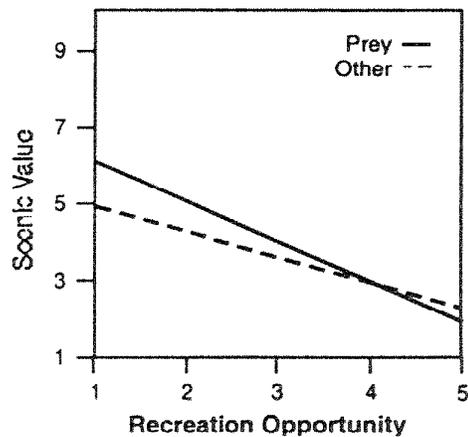


Figure 6. Prey recreationists and others evaluation of harvested scenic value and recreation opportunity.

Conclusions

The results of this study indicate important relationships between forest recreation participation and scenic value assessments. All respondents have similar high scenic ratings for unharvested views. However, motorized and prey recreationists tend to rate harvested views as more scenic than do non-participants of these sports.

Prey sports enthusiasts also associate positive recreation opportunities with clearcutting. Motorized recreationists also have this tendency, though it does not achieve statistical significance. For both prey and motorized recreationists there is an interaction effect such that the greater the recreation opportunity they anticipate from harvesting, the higher their scenic value ratings of harvested areas.

Trends in forest-oriented recreation participation make these findings especially important for forest planners and policy makers. For instance, the major shifts in ethnic diversity and age structure of our population are having dramatic effects on recreation patterns (Dwyer 1994).

Recreation participation for Americans over 16 years old is reported in table 7 for 1982 and 1994. During this 10 year period the population grew by 14 percent. However, the actual numbers of prey recreationists had dropped. This is important because these participants are the most tolerant of scenic impacts and see greater recreation opportunity from timber harvesting. On the other hand, participants in motorized sports are increasing. They are also tolerant of the scenic impacts from harvesting, and anticipate more recreation opportunities from it.

In contrast, campcraft recreationists are experiencing substantial increases in their numbers. They tend to be sensitive to scenic impacts and see little recreation opportunity associated with harvesting. There are also dramatic increases in study-oriented recreation. This group sees no recreation opportunity associated with timber harvesting.

Table 7. Changes in recreation participation.

| | Millions | | Percent |
|------------------|----------|--------|---------|
| | 1982-3 | 1994-5 | Growth |
| Campcraft | | | |
| Canoeing | 14.1 | 13.2 | -6.4 |
| Camping | 29.9 | 41.5 | +38.8 |
| Backpacking | 8.8 | 15.2 | +72.7 |
| Study | | | |
| Study nature | 21.1 | 62.5 | +196.2 |
| Cultural site | | 88.3 | |
| Environ. ed. | | 93.0 | |
| Motorized | | | |
| ATV/ORV | 19.4 | 27.8 | +43.3 |
| Snowmobile | 5.3 | 7.0 | +32.1 |
| Power boat | 33.4 | 46.9 | +40.4 |
| Prey | | | |
| Fishing | 59.8 | 58.3 | -2.5 |
| Hunting | 21.1 | 18.8 | -10.9 |
| Population | 176 | 200 | +13.6 |

Note. 1982 values from USDI (1986), and 1994 values from Cordell (1995).

Overall, these changes indicate that the numbers of recreationists who believe sustainable even-aged forest management provide improved recreation opportunity may be on the decline. Similarly, participants in the recreation

areas with the most growth also are the least tolerant of scenic impacts associated with clearcutting.

Acknowledgments

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INCORPORATING BROAD-BASED VALUES INTO NATURAL RESOURCE DECISIONMAKING: CONCEPTUAL AND MEASUREMENT CHALLENGES¹

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Abstract: Optimal resource allocation requires meaningful measures of the values involved. Traditionally, resource managers have relied on economic values or surrogate measures of economic value such as willingness to pay. However, many commodities with which natural resource managers must deal are common property resources that lie outside traditional markets and are not suited to neoclassical economic analysis. This paper reviews the different conceptions of value and valuation techniques that have been developed to incorporate broad-based public values into decisionmaking.

Introduction

Public natural resource managers are charged with satisfying human wants for a variety of goods and services from a limited resource base. Since many natural resources are common property, allocation decisions often fall outside the market and involve value-laden issues of distribution and sustainability.

From an economic perspective, value can be defined as the worth of an object as measured by the sacrifice that one is willing to make to benefit from that object; hence, one measure of worth is the willingness to pay in monetary terms. Yet the term "economic value" as associated with natural resource planning, is usually a misnomer. Except under

exacting conditions—general equilibrium, which occurs only under pure competition—market price is not a meaningful measure of relative value (Glass et al. 1993). As the market deviates from general equilibrium, the relationship between prices and value becomes vague. The underlying assumptions of pure competition—producers and consumers who are highly knowledgeable about prices and resource availability—generally are absent in public resource allocations. Further, the neoclassical economics paradigm is best suited to deal with homogeneous products rather than the packages of differentiated services most often sought by the public.

Public Values for Natural Resources

To provide meaningful information for resource allocation decisions, the context of the value measure must be consistent with that of the allocation question. Market-related measures are useful in the limited contexts of the market, but as the area of concern broadens, these measures grow less relevant. For example, scarce salmon harvesting opportunities cannot be allocated effectively by considering market measures alone.

Commercial fishing productivity can be measured by total revenues generated, net monetary returns at some level of harvest processing, and the employment generated. While these measures are significant, other factors must be considered in allocation decisions. Sport fishing also stimulates the economy through expenditures by participants, and provides food and other benefits related to participation.

Subsistence activities reap benefits beyond the nutritional value of the fish, including those attributable to involvement in the system, lifestyle benefits, and community cohesion (Muth et al. 1991). Finally, a large segment of the nonharvesting public has a legitimate concern for the well-being of the salmon fishery.

Traditional monetary measures can be useful for some resource allocation situations. For example, feasibility analysis of proposed actions by private firms provides useful input for investment analysis. If the decisionmaking unit is too small to affect the market, and uncertainty is not serious, other calculations of net present worth or rate of return provide a sound basis for decisionmaking. However, these simple measures are usually inadequate for public resource management. In both the public and private sector, calculations of monetary net flows are less useful as exogenous factors increase. Also, public agencies seldom have the responsibility to maximize net revenues, but generally must consider long-run resource sustainability and equity in the distribution of benefits and costs. In so doing, they may sacrifice present net worth. Such societal goals often are expressed in regulations and laws (Multiple-Use/Sustained Yield Act, National Forest Management Act) and provide a vastly different context for decisionmaking than the neoclassical economics view of a private firm. Public agencies also provide social goods (Musgrave and Musgrave 1976) that do not lend themselves to allocation through the market because consumers are not excluded from benefits even if they are unwilling to pay. There are also "merit goods" which could be allocated through the market, but which have such important social value that they are provided through the public sector beyond the level provided by the market.

¹ Editor's Note: This paper was originally presented at the Malama Aina (Preserve the Land) 95 Conference in Honolulu, HA, July 28, 1995. Unfortunately, it was inadvertently left out of their proceedings. Since Ron Glass has retired, the NERR Steering Committee has agreed to publish the manuscript in recognition of Ron's frequent contributions to the NERR.

Externalities--the impacts of actions by one decisionmaking unit on the activities of others (McKean 1958)--are another concern for public resource managers that private firms often can avoid. Externalities are not apt to affect those responsible for bringing them about, but the associated costs or benefits affect other sectors of society. Since externalities fall outside the market, private firms have no incentive to produce beneficial outputs or reduce harmful outputs. By contrast, externalities are included within the broad area of public sector concern.

The appropriate measures of "value" often are dictated by circumstances. Business leaders and politicians are usually interested in economic stimulation related to specific activities in their communities, even if such measures have no national significance (Sorg and Loomis 1984). For instance, the jobs stimulated by fishery-related activities or timber harvesting often are primary considerations in national forest planning even though producing these commodities may conflict with other resource uses and may be irrelevant on a larger scale; that is, local gains can cause losses in other localities. Further, these measures do not represent resource values in themselves, but enhance the quality of life for the beneficiaries and thus have associated values.

Quasi-market measures sometimes are used to value public goods in monetary terms. The market comparison method uses the known price of specific goods or services to estimate the value of comparable goods or services. While this seems simple and straightforward, it requires considerable skill to apply effectively, particularly where imperfect substitutes are involved. Judgment must be used to select the appropriate market outlets from which the comparisons are made. The market comparison method often is used for taxation and legal purposes to establish "land values" based on the market price of comparable lands. Since historical data usually are involved, market comparisons are most reliable during periods of long-run price stability.

Another method of estimating the comparative value of specific resources entails calculating opportunity costs. An opportunity cost is the value foregone when one resource use is chosen over another. When several opportunities are sacrificed, the alternative with the next highest value to that of the chosen action represents the opportunity cost. Opportunity costs are usually expressed in monetary terms, though this is not essential. For example, the opportunity cost of a logging operation could be expressed by the acreage of wilderness sacrificed. As with the other valuation techniques, opportunity costs can provide useful insights for planning if their limitations are recognized.

Estimates of willingness to pay often are used to infer the economic values of nonmarketed goods and services. The total area under a demand curve represents the willingness to pay (i.e., value) for a resource. However, even empirically established demand curves are subject to limitations. Demand functions are temporary, representing a relationship during a specific time; their extended relevance depends on the degree of market stability. It is difficult to empirically establish a demand curve with data collected over several years because nonprice variables exogenous to the demand model--such as population and income changes--may occur

during the interval. Demand curves best fit homogeneous products and are difficult to apply to packages of different services which are imperfect substitutes for one another, such as many fish and wildlife-related activities.

Consumer's surplus, the difference between the total money consumers are willing to pay and what they actually do pay for a good or service above market equilibrium, is a concept related to demand that often is used to estimate economic welfare or social value. Even as a measure of welfare, consumer's surplus is controversial. Such noted economists as Paul Samuelson and I.M.D. Little have criticized it. Little (1963) saw no value in consumer's surplus because of its subjective interpretation and limiting assumptions, referring to it as "a totally useless theoretical toy." However, Willig (1976) and Morey (1984) suggested that it can be a practical measure of welfare under certain conditions.

Despite the controversy, consumer's surplus estimates frequently are relied upon to value resources, especially when nonmarket uses are involved. Even if one accepts consumer's surplus as a legitimate measure of value, its utility in valuing differentiated services is limited. Actually, the most relevant information for resource managerial and allocation decisions is changes in consumer's surplus or social value attributable to specific actions. Consumer's surplus measures the maximum that consumers would pay rather than doing without a resource and is, therefore, an "all or nothing" measure (Talhelm 1984). This represents an extreme situation that resource managers rarely face.

Despite its shortcomings, consumer's surplus provides useful information in specific contexts. Several techniques have been developed to measure consumer's surplus for goods and services not allocated through the market. The two most common are travel cost, which is based on behavior, and contingent valuation, in which valuation is based on hypothetical market situations. While each technique has limitations, researchers continue to improve them.

Although use values traditionally have been dominant, there has been growing attention to the concerns and preferences of nonusers. The widespread support of the conservation movement indicates that people who do not themselves use specific resources often have intense interest in the well-being of those resources.

Weisbrod (1964) was an early proponent of considering nonuse values in resource allocation decisions. Option values (demand) represent the willingness of an individual to pay in the present to preserve future opportunities to use a resource even though no current use is contemplated. Four conditions must exist for option value to be significant: (1) purchase uncertainty, (2) nonstorability, (3) a unique quality of the good (no good substitutes exist), and (4) an extremely high cost of increasing production once it has been curtailed (Reiling and Anderson 1980).

Considerable literature has been devoted to option value, its relationship with expected consumer's surplus, and its appropriateness in natural resource planning and allocation. Reiling and Anderson (1980) concluded that option price is a superior measurement of benefits for an individual in

society in the abstract, but it ignores equity in the distribution of benefits. Society may not accept restrictions on the use of public facilities to only those willing to purchase options.

While option values relate to retaining the opportunity to use a resource in the future, existence values (Krutilla 1967) concern the value people place on a resource even though they anticipate no personal use of that resource at any point.

The definition and conceptual foundation of existence values continue to evolve. While existence values do not involve the direct personal use by the valuator, there are questions about underlying motivations. Randall and Stoll (1983) defined pure existence value as being based on the knowledge that a resource exists. They assert that existence value must be motivated by altruism, including intergenerational altruism, termed bequest values by McConnell (1983) and Stevens et al. (1991). Likewise, Boyle and Bishop (1987) suggested that existence values are nonuse values that arise solely from altruistic motivations including bequest. Bishop and Welsh (1992) broadened the list of motives to include concern for the resource itself based on intrinsic values, but included altruism and bequest motivations. However, Brookshire et al. (1986) asserted that bequest value is an intertemporal externality and should be considered an option value rather than an existence value. Stevens et al. (1991) provided empirical evidence that altruism, bequest, and intrinsic motivations underlie existence value. However, the desire to provide continued existence of a resource to benefit others might be a special case of altruism rather than a motivation for existence value. Altruism manifests itself in many ways in our society (e.g., aid to dependent children, public health care for low-income households), and preserving the existence of a given resource to benefit other people can be viewed similarly.

People derive a continuum of uses from natural resources that place different demands on the resource base and involve diverse sets of values (Table 1). Consumptive uses such as mining deplete the resource base and usually are expressed in public-sector monetary flows. When people consume these goods outside the market, consumer's surplus provides one measure of value, albeit somewhat arbitrarily. In other situations (e.g., campsite occupancy), people actually consume services to the exclusion of others in the short run, but there is no resource depletion. Sometimes people harvest or consume resources but have no lasting impact on resource availability for others. For example, harvesting surplus salmon once a river system reaches its spawning escapement capability will have no long-run impact on resource availability. The returning salmon will die in a short time and the spawning capability of the system is already fully utilized. Therefore, current consumption has no significant impacts except for the local availability of a deteriorating resource in the very short run. By contrast, harvesting salmon in a system that has not reached its escapement capability can have a long-run impact.

There are cases where people use services related to natural resources but do not physically consume the resource. For example, viewing scenery has no impacts on the resource if care is taken to avoid potential problems. Vicarious uses are

even further removed from physical site use. Consumers are not involved with the resource base, but those producing the associated goods and services, such as videos, may have impacts.

With option and existence values, use may be defined as the satisfaction in knowing that certain resources are being preserved. There should be no negative impacts unless mistakes are made or more substantial opportunity costs are involved.

Moral values underly all allocative questions but tend to defy measurement. Nonetheless, objective value measures can help address allocative questions and place moral issues in better perspective. However, even to accomplish this requires meaningful measures that lend themselves to comparisons with other values.

Valuation Methods and Problems

Value measurement is a challenge also. Inferences to the relevant population are based on sample characteristics that introduce uncertainty. Nonresponse poses a challenge and relatively high standard errors make application to actual decisionmaking difficult.

If interpreted within the limits of their context, traditional market-related measures of value can be useful. Obviously, even these kinds of data must be collected with sufficient detail to facilitate interpretation with respect to meaning, reliability, and consistency with other value measures. For example, it is difficult to compare the monetary value of salmon fisheries if the available data represent different levels of processing or are collected at different times or locations. To be useful, such information must be reduced to comparable units. And the meaning of measurements in terms of the public interest often is vague. For instance, one cannot relate the monetary value of salmon at the first buyer level to social welfare without other information. To be meaningful, the context must be clearly defined and the data's reliability specified.

Several techniques have been developed to estimate consumer's surplus. The travel cost method uses travel behavior to estimate the consumer's surplus accrued to individuals based on limiting assumptions. Travel cost is most appropriate for individual sites and, in its simplest form, does not consider exogenous factors like substitutes or multipurpose trips. It is best in situations involving all or nothing tradeoffs. Advancements to the travel cost method (Vaugh and Russell 1982) have attempted to deal with these limitations to provide more useful input to the allocation process.

Contingent valuation estimates of consumer's surplus question participants or potential participants directly. Most questions solicit information on the individual's willingness to pay to participate in an activity. This information permits the construction of a demand schedule under the ceteris paribus conditions and, with the aid of cost estimates, consumer's surplus can be calculated. For example, an individual's willingness to pay identifies a point on the price-demand

curve, and a sufficient number of these points provides the basis for estimating the demand curve. The area under the demand curve includes both consumer's surplus and consumer's expenditures. Together, these constitute the total monetary value. As an alternative, contingent valuation questions may be stated so that direct consumer's surplus responses are obtained, making demand curve construction unnecessary.

Rather than asking about willingness to pay for resource use, we can ask about the maximum an individual will accept to forego the use of that resource (willingness to accept). The results can be used to construct an offer curve to calculate the total area under the curve and also the consumer's surplus.

These calculations require supporting cost information. Again, the questions can solicit direct estimates of consumer's surplus so that information on consumer costs is not necessary. People might assume that estimates of willingness to pay and willingness to sell are not likely to vary significantly, but practice has shown otherwise. Willingness-to-sell values tend to be substantially higher than willingness-to-pay estimates. One explanation is that individual ownership rights for a resource convey a sense of moral responsibility (Boyce et al. 1992).

Since contingent valuation requires sampling relevant populations, it can be expensive and time consuming. Both the sampling design and the structure, design, and wording of the questionnaire or interview schedule are critical. Particular care must be taken not to ask leading questions or make the respondents believe they are involved in some form of gamesmanship; strategic responses that influence results are easily precipitated.

Except in rare cases where reliable historical information is available, contingent valuation is the principal means of soliciting willingness-to-pay information on option and existence values. Contingent valuation estimates are based on hypothetical situations, and individuals expressing willingness to pay are not necessarily constrained by the realities of budgets. Often, willingness-to-pay questions are directed at alleviating a hypothetical problem, but do not actually ask the resource's value. While such questions are interpreted as an expression of value, it is an arbitrary interpretation. Willingness to pay also may be affected by question credibility or uncertainty about goal achievement (will my donation really have an impact?).

When attempting to quantify existence values, apparent inconsistencies of responses have posed an interpretation problem. Since existence values include ethical concerns, the narrow self-interest assumptions of the neoclassical paradigm do not apply well. Although one criticism of contingent valuation suggests that respondents may not go through an actual budgetary exercise when considering the amount of a donation, this may be a superficial concern within the context of the relationship between value, willingness to pay, and ability to pay. We must ask if the values that individuals place on resources are constrained by their personal income, and if this is a legitimate constraint.

There also are difficulties with individuals who use or value given resources but do not feel compelled to make a payment on that basis. "Free riders" may value resources but expect others to pay rather than themselves. Others may value a resource but believe it is morally wrong to represent such values by monetary measures (Stevens et al. 1994). People also may value given resources but may be unwilling or unable to commit to a monetary donation to ensure their existence (Glass et al. 1990).

Interpretation questions also plague contingent valuation. Many respondents are willing to give to "a good cause" or contribute "their fair share," though these commitments do not relate specifically to the resource in question (Stevens et al. 1994). These payoffs are similar to the "warm glow" effects and purchase of moral satisfaction described by Kahnemann and Knetsch (1992). People faced with decisions between personal preferences and values also may experience ambivalence, leaving them in a state of indecision (Opaluch and Segerson 1989).

Another difficulty related to contingent valuation estimates of existence value involves relationships between willingness to pay and moral issues or, at the least, the difficulty respondents might have in expressing moral values in monetary terms. Even with less abstract values than existence, unfamiliarity with placing monetary values on nonmarket resources might pose a problem.

To overcome some of these difficulties, alternative measurement techniques have been advanced. Conjoint analysis, a derivative of contingent valuation, offers promise in overcoming some of the difficulties associated with conventional contingent valuation. Conjoint analysis involves setting preferences for attribute bundles, and avoids the difficulties of directly placing monetary worth on given resources. The use of this method to collect more reliable estimates of existence and other values is being explored.

Discussion

Securing optimal allocations of natural resources among competing claimants can be enhanced by meaningful measures of the values involved. Managers tend to be more comfortable in dealing with facts than with values, so there has been a considerable effort to reduce many values to objective terms analogous with facts. While most values have both subjective and objective components, the latter are measured more readily. For example, monetary worth of existence values can be estimated though existence also has a subjective component. Moral concerns underly many values and are more difficult to express in monetary or other measurable terms. As a result, even when estimates of values are available, they must be considered in terms of their limited context as related to the specific managerial situation.

Even though there are no all-encompassing measures, and many values defy measurement altogether, quantification in appropriate cases can provide essential input to natural resource managers. Understanding the diverse conceptual foundations of value represents one of several challenges to effective measurement. While measuring values within

specific contexts can be an asset, there is a tendency to force value measurements into situations in which they are inconsistent with the allocation questions. For example, no matter how efficient a market allocation may be by traditional, neoclassical precepts, it does little to solve equity or long-run sustainability problems, both of which often are legal mandates. Again, the context of a value measure must be consistent with the problem's context.

Natural resource managers typically are confronted with an array of values that are measurable to varying degrees, and which may conflict. Quantitative value measures are preferred, but these must be relevant to the questions being considered. For example, even impressive dollar figures purported to measure some sort of value can collapse when scrutinized for definition, context, and reliability. Clearly, inaccurate figures introduced into the decisionmaking process are counterproductive even if included with the best intentions. Even with estimates that are relevant to the management problem, interpersonal and intercontextual comparisons of value remain subjective and arbitrary, so skilled analysts familiar with the strengths and limitations of the measure are an essential part of management teams dealing with these complex issues.

Economists have attempted to alleviate some of the problems associated with the interpersonal measurement of values by using aggregates. Unfortunately, aggregate estimates of the public's willingness to pay to secure some objective ignores the intricacies of individual decisionmaking. Estimates of preservation values, such as existence, often involve both objective and subjective components of value which confuses the meaning of preservation donations.

In summary, integrating diverse and often conflicting values into multiple systems for objective decision support is a formidable challenge but one that must be overcome to secure broadly accepted allocations of natural resources to competing claimants. However, the question of where and how values can be fitted into these multiple systems remains.

This might be done on several levels. Where adequate data are available and intercontextual comparisons do not present a serious limitation, quantifiable values can be treated as variables endogenous to the model. In cases where data limitations or intercontextual inconsistencies pose a problem, values may be represented by constraints such as safe minimum standards for endangered wildlife species (Stevens et al. 1991). Where values defy measurement and are exogenous to any modeling effort, they can still be included in the design and structure of the model. Interpretation of alternative value sets is a primary consideration and subjective concerns must be included in the decisionmaking process.

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