Indicators and standards of quality for paddling on Lake Champlain

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A B S T R A C T
Lake Champlain is host to a diversity of recreational and other uses that may have social and ecological impacts. Questions of how much and what type of use should be allowed in recreation areas can be addressed through carrying capacity frameworks, using indicators and standards of quality. This study focuses on indicators and standards of quality for paddling on the lake along a non-motorized kayak and canoe trail. A number of indicator variables are identified, including scenery, quiet and solitude, being on the water, presence of wildlife, motorized watercraft, shoreline development, and invasive lake vegetation. Standards are formulated for three variables: 1) presence of sailboats and motorboats, 2) shoreline development, and 3) campsite impacts. Study findings indicate that conditions typically experienced by paddlers are nearing the minimum acceptable condition for both the number of motorboats and sailboats on the lake and the amount of shoreline development. Monitoring and management may be needed to maintain high quality paddling experiences on the lake.

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Introduction

Lake Champlain, located along the borders of Vermont, New York, and Quebec in the U.S. and Canada, is host to a diversity of recreational uses, including sailing, motorized boating, jet skiing, fishing, hunting, swimming, and diving. Promoting sustainable recreational activities on Lake Champlain is one of the goals of the Champlain Valley National Heritage Partnership (CVNHP) management plan (Lake Champlain Basin Program, 2010). Among the programs supported by the CVNHP is the Lake Champlain Paddlers’ Trail (LCPT), a canoe and kayak trail established in 1996 to promote low-impact recreational use of the lake. The trail is overseen by the Lake Champlain Committee (LCC), a nonprofit conservation organization, and currently consists of 39 overnight and day-use sites on town, state, and private land (Lake Champlain Committee, 2010).

Paddling is a popular activity on Lake Champlain. In a recent survey of anglers, boaters, lakeside homeowners, and conservation organization members, it was found that 52% of respondents owned a canoe or kayak that they use on the lake (Capen et al., 2010). However, paddlers share the lake with a variety of other users. An aerial survey identified nearly 1400 boats on the water during a peak summer day; 21% of these boats were non-motorized (Capen et al., 2010).

While paddling is a relatively sustainable form of lake recreation, kayakers and canoeists can cause social and ecological impacts through their use of the lake. For example, large or noisy paddling groups may be disruptive to other lake visitors. Heavy use of LCPT campsites may also have ecological consequences, such as soil compaction or tree damage. During summer months, the lake experiences high levels of recreational activity. Other recreational uses of the lake, particularly motorized boats, may degrade the quality of the experience for paddlers. The degree to which impacts from paddling and other uses, impact visitor experiences on the lake can be addressed through carrying capacity frameworks, using indicators and standards of quality.

Indicators and standards of quality

In the context of outdoor recreation, carrying capacity addresses questions of how much and what type of use should be allowed in parks and related areas (Manning, 2007). Contemporary carrying capacity frameworks include Visitor Experience and Resource Protection (VERP), developed by the National Park Service (National Park Service, 1997), and Limits of Acceptable Change (LAC), developed by the U.S. Forest Service (Stankey et al., 1985). Indicators and standards of quality are central to these outdoor recreation planning and management frameworks. Indicators are “measureable, manageable variables that help define the quality of parks and outdoor recreation areas and opportunities,” while standards can be defined as “the minimum acceptable condition of indicator variables” (Manning, 2007).
Once indicators and standards of quality have been formulated, indicators of quality are monitored and management action is taken to ensure that standards of quality are maintained. Indicators and standards of quality have been formulated for a variety of issues that can impact the quality of recreational experiences (Manning, 2004).

In recent years, normative theory and associated visual research methods have been used to measure visitor standards for social and ecological conditions (Manning et al., 1996; Manning and Freundm, 2004; Vaske and Whittaker, 2004). In this approach, survey respondents are shown a series of photographs that depicts a range of impact levels for an indicator variable (e.g., number of boats on a lake). Aggregate evaluations of these images are then plotted on a graph to form a social norm curve, such as the hypothetical one depicting numbers of hikers along a trail (Fig. 1). Social norm curves have been applied widely in outdoor recreation research to understand visitor perceptions and evaluations of a number of indicator variables, including crowding, behaviors of others, resource conditions, and management actions (Vaske and Whittaker, 2004). The minimum acceptable condition, a potential standard, can be identified as the point at which the curve crosses neutral on the evaluation scale (the point at which aggregate evaluations fall out of the acceptable and into the unacceptable range). The distance between the extremes of the curve and the neutral evaluation line is known as norm intensity, or salience, and is representative of the strength of feeling that respondents have about the indicator variable. The amount of variance around each point on the curve, known as crystallization, reflects the amount of agreement that respondents have about the social norm. Crystallization can be measured using Van der Eijk’s measure of agreement (A) (Krymkowski et al., 2009). Van der Eijk’s A ranges from −1 to +1, with −1 indicating complete polarization, 0 indicating a uniform distribution, and +1 indicating complete agreement.

**Indicators and standards for paddling on Lake Champlain**

Normative methods have been applied primarily to terrestrial settings, including national parks, national forests, and wilderness areas (Manning, 2007). A number of studies have also examined normative standards related to boating, fishing, and floating in rivers. However, less attention has been given to lake environments. An early study examined visitor standards for encountering canoes and motorboats in the Boundary Waters Canoe Area (BWCA), MN (Stankev, 1973). Subsequent studies in the BWCA focused on canoeist norms for encountering other paddling groups (Watson, 1995; Lewis et al., 1996). The number of boats moored in bays at the Apostle Island National Lakeshore was the focus of another study (Heberlein et al., 1986). Recently, visual research methods were employed to determine visitor standards for seeing boats at Lake Umbagog National Wildlife Refuge, NH (Manning et al., 2010). Normative methods have also been applied in marine environments. In one study, normative standards for encountering snorkelers, divers, and boats at coral reef sites in the Florida Keys were determined (Loomis et al., 2008a,b,c). In another study, a series of computer generated photographs was used to formulate standards for seeing snorkelers at the Great Barrier Reef in Australia (Inglis et al., 1999).

This study builds upon previous research in a number of ways. First, normative methods, using indicators and standards of quality, are extended to a canoe and kayak trail. Second, this non-motorized water trail is examined in the context of a lake that accommodates many recreational and other uses (e.g., motorized boating, fishing, ferry transport). In contrast, the BWCA is a designated wilderness, with paddling areas zoned predominantly for non-motorized use only. Third, Lake Champlain falls under the jurisdiction of multiple entities, including local, state, national, tribal, and international governments. Freshwater lakes examined in other normative studies have been managed by a single agency (e.g., Fish & Wildlife Service). Fourth, normative standards in a lake setting are extended beyond crowding (e.g., encounters with other boaters). In this study, other dimensions of paddling are also examined. In particular, standards for resource conditions at LCPT campsites and standards for shoreline development are determined. The issue of ecological change and visitor standards for campsite conditions is discussed more fully in a companion paper for this study (Goonan et al., 2012).

**Methods**

During the fall of 2008, semi-structured qualitative interviews were conducted with experienced kayakers and canoeists (n = 5), state and town agency personnel (n = 3), nonprofit Lake Champlain organization leaders (n = 2), and local paddling business owners and guides (n = 3). Potential interviewees were initially identified through a search of websites for agencies, organizations, and businesses related to paddling on Lake Champlain. Each interviewee was then asked to recommend other key individuals who should be contacted for the study. This process continued until no new contacts were suggested. Thirteen interviews were recorded, transcribed, and analyzed to identify potential indicators of quality for paddling on the LCPT. Representative questions addressed elements of the paddling experience on Lake Champlain that were enjoyed most and least. A comprehensive list of indicator variables, identified during the qualitative interviews, was incorporated into a mail survey that was administered to members of the LCC during August and September of 2009. LCC members were selected to participate in the study based on whether they elected to receive the annual Paddlers’ Trail guidebook. This approach was chosen for two reasons. First, membership in the LCC is a requirement for paddling and camping along the LCPT. Second, the LCC membership list provided an efficient way to reach a large sample of paddlers. Paddling on Lake Champlain is distributed across a large geographic area, with access occurring from multiple points, characteristics that present a challenge for obtaining an adequate sample in the field. After accounting for the removal of five international addresses and six non-deliverable addresses, an effective sample of 467 mailing addresses was identified.

Following methods described by Dillman (2000), an initial survey packet was mailed to potential respondents in mid-August 2009. The packet included a cover letter, a copy of the 7-page questionnaire, a map showing the names and locations of Paddlers’ Trail campsites, three photo booklets, and a postage-paid return envelope. One week after mailing the initial packet, all potential respondents were sent a post-card that reminded them about the study, emphasized the importance of their participation, and thanked them for completing.

![Fig. 1. Hypothetical social norm curve.](From Manning, 2011)
the survey if they had already done so. About 3 weeks after the initial mailing, a story about the survey was posted in the LCC e-newsletter Lake Ripples. The article reminded paddlers about the survey, and encouraged their response. A few days later, a second packet of survey materials was mailed to potential respondents who had not yet returned the questionnaire. A total of 298 surveys was returned from the two mailings, yielding a response rate of 63.0%.

Since it was plausible that some LCC members who were not paddlers may have requested to receive the Paddlers’ Trail guidebook, the survey included a screening question that asked respondents if they had paddled on Lake Champlain in the last 10 years. Eighty-five of the returned surveys came from “inactive” paddlers who did not complete the remainder of the survey. Of the 213 individuals who completed the survey, 92% had paddled on the lake at least once during the previous year. Following the screening question, a number of open- and close-ended questions were incorporated to identify indicators and standards of quality for paddling on Lake Champlain. In particular, respondents were asked what they most and least enjoy about paddling on the lake. Respondents then indicated the extent to which they believed a list of 16 potential issues were problems for paddlers on Lake Champlain, rating each item as “not a problem,” a “small problem,” or a “large problem.”

A series of questions measured standards for three dimensions of paddling on Lake Champlain: a) the number and type of boats on the lake, b) the amount of shoreline development, and c) the level of impact to campsites. To measure standards for the number and type of boats seen on the lake, respondents were presented with ten computer-edited photographs showing different numbers of sailboats and motorboats (Fig. 2). One photograph showed zero boats on the lake. Three included only sailboats (6, 12, and 18), three included only motorboats (6, 12 and 18), and another three included a 50/50 mix of sailboats and motorboats (3/3, 6/6, and 9/9 sailboats/motorboats). Photographs were presented in random order on 8.5 × 11 inch pages in three photo booklets. To measure standards for the amount of shoreline development, respondents were presented with a series of nine photographs depicting between zero and 15 houses along the shore (Fig. 3). Standards for environmental impacts at campsites were measured using a series of nine photographs in which campsite size and vegetation cover were varied (Fig. 4). Photographs depicted all possible combinations of small, medium, and large size campsites (30, 85, and 125 m²) with high, medium, and low percentages of vegetation cover (88, 55, and 12%).

For the three sets of photographs, respondents were asked to rate the acceptability of each photograph on a nine-point scale ranging from −4 (“very unacceptable”) to +4 (“very acceptable”). Additionally, respondents were asked to select the photograph that looked most like the number and types of boats, the amount of shoreline development, and the amount of environmental impact that they typically see on the lake. For the series of photographs showing environmental impact at campsites, respondents were given the option of indicating that they had never camped at a LCPT campsite.

Results

Respondent characteristics

Respondents reported taking an average of seven paddling trips during the previous year (SD = 10), with over half (54%) taking between one and five trips. Most paddlers (85%) spent a day or less on the lake during their longest outing. Just 15% had taken multi-day paddling trips on Lake Champlain, with 3% reporting that they had paddled the lake from end-to-end. Paddling use was concentrated during summer months, with 92% of respondents visiting the lake from June to August. About half (49%) had paddled during the autumn (September to November), and less than a quarter (22%) paddled during the spring (March to May). Nearly 88% of respondents were aware of the LCPT, with 39% reporting that they had followed the trail on one of their paddling trips.

Indicators of quality

Qualitative interviews with paddlers, state agency personnel, conservation leaders, and business owners yielded a number of potential indicators of quality for paddling on Lake Champlain. In particular, interviewees expressed concern about motorized watercraft (e.g., motorboat speed and noise and wakes created by motorized watercraft), increased shoreline development, issues of lake access (e.g., lack of publicly owned shoreline, distance between access points), and visitor behavior at campsites (e.g., cutting live trees for firewood, leaving belongings at campsites to reserve them). The importance of the natural environment and seeing wildlife was also mentioned by most interview participants.

Questions in the paddler survey provided additional insights into the indicators of a quality paddling experience on Lake Champlain. In
an open-ended question, the majority of respondents (60%) indicated that scenery and surrounding beauty were among the items they most enjoy while paddling on the lake. Other most enjoyed items include quiet and solitude (mentioned by 35% of respondents), being on the water (25%), and seeing wildlife (20%). Conversely, motorized watercraft was mentioned by three-quarters of respondents (75%) as what they least enjoy about paddling on the lake. Other items least enjoyed by paddlers include lake vegetation, such as algae, weeds, milfoil and water chestnut (mentioned by 18% of respondents), rough lake conditions, including waves and wind (15%), and polluted/littered water (15%). When given a list of 16 items that could be potential problems for paddlers on Lake Champlain, issues related to motorboats, a lack of publicly owned shoreline and shoreline development, and algae blooms were evaluated as most problematic (Table 1). On the other hand, encountering too many kayaks and canoes on the lake was rated as “no problem” by nearly all paddlers.

Standards of quality

Paddler acceptability ratings for photographs showing different numbers and types of boats on Lake Champlain are depicted in the social norm curve in Fig. 5. For both types of watercraft, acceptability ratings decreased as the number of boats increased. High norm intensities indicate that paddlers have strong feelings about the presence of sailboats and motorboats on the lake. For all of the photographs in which boats were present, motorboats were evaluated as significantly less acceptable ($p < 0.05$) than sailboats. Van de Eijk's $A$ ranged from 0.20 for six mixed boats to 0.84 for zero boats, indicating...
moderate to high levels of crystallization. The social norm curve crossed the neutral point of the acceptability scale (i.e. fell out of the acceptable range and into the unacceptable range) at 6.6 motorboats, 7.8 mixed boats, and 8.6 sailboats. When asked which picture looked most like the number and type of boats typically seen on the lake, a majority (62%) selected the photograph containing three sailboats and three motorboats. Sixteen percent selected the photograph with six motorboats, and 11% chose the photo with zero boats. 

Respondent acceptability ratings for shoreline development on Lake Champlain are shown in the social norm curve in Fig. 6. Acceptability levels decreased as the number of houses along the shore increased. Paddlers exhibited moderate norm intensity for this indicator variable. Van der Eijk’s A ranged from 0.22 for twelve houses to 0.91 for zero houses, indicating moderate to high levels of agreement. The social norm curve crossed the neutral point of the acceptability scale at nine houses. Respondents reported they typically see an average of eight houses (SD=3.7) along the shoreline during paddling trips.

Paddler acceptability ratings for environmental impact at campsites are shown in the social norm curves in Fig. 7. Within campsites of the same size, acceptability ratings decreased as vegetation cover loss increased. However, norm intensity for campsite impacts was low to moderate. Van der Eijk’s A ranged from 0.21 for large campsites with moderate vegetation cover to 0.58 for small campsites with high vegetation cover, indicating moderate levels of agreement. For small campsites, all three vegetation cover levels were rated as acceptable by paddlers. For medium and large campsites, the social norm curve crossed the neutral point of the acceptability scale at 38.4% and 57.4% vegetation cover, respectively. Sixty paddlers (28% of respondents) reported that they had camped at one of the LCPT campsites. Seventy-eight percent of these individuals reported that they typically see campsites that are within the acceptable range. Of paddlers who had seen campsites in the unacceptable range, 15% saw large campsites with

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Perceived problems for paddlers on Lake Champlain.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=213</td>
<td>No problem</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Motor boats traveling too fast</td>
<td>16.0</td>
</tr>
<tr>
<td>Too much noise from motor boats</td>
<td>16.3</td>
</tr>
<tr>
<td>Lack of publicly owned shoreline</td>
<td>23.2</td>
</tr>
<tr>
<td>Encountering algae blooms while paddling</td>
<td>24.8</td>
</tr>
<tr>
<td>Too much shoreline development</td>
<td>25.4</td>
</tr>
<tr>
<td>Large wakes created by motor boats</td>
<td>30.6</td>
</tr>
<tr>
<td>Smell of engine oil from motor boats, ferries, and barges</td>
<td>28.2</td>
</tr>
<tr>
<td>Poor water quality</td>
<td>30.5</td>
</tr>
<tr>
<td>Encountering water chestnuts or other vegetation that is difficult to paddle through</td>
<td>33.0</td>
</tr>
<tr>
<td>Too many motor boats on the lake</td>
<td>31.0</td>
</tr>
<tr>
<td>Lack of public access areas</td>
<td>42.3</td>
</tr>
<tr>
<td>Lack of campsites</td>
<td>46.9</td>
</tr>
<tr>
<td>Lack of wildlife viewing opportunities</td>
<td>56.5</td>
</tr>
<tr>
<td>Large wakes created by ferries/barges</td>
<td>57.6</td>
</tr>
<tr>
<td>Interactions with fishing nets and lines</td>
<td>84.2</td>
</tr>
<tr>
<td>Too many kayaks/canoes on the lake</td>
<td>99.5</td>
</tr>
</tbody>
</table>
moderate vegetation cover, while large and medium campsites with low vegetation cover were seen by 5% and 2% of campers, respectively.

Discussion

Findings from this research indicate that characteristics of the natural environment, including scenery, quiet and solitude, being on the water, and presence of wildlife, are important indicators of a quality paddling experience on Lake Champlain. Conversely, the conditions that most detract from these experiences are largely related to human activity, and include noise, wakes, and safety concerns associated with motorized watercraft, shoreline development, and invasive lake vegetation, such as algae and water chestnut, and water pollution.

Normative standards were developed for three indicator variables: 1) presence of sailboats and motorboats, 2) shoreline development, and 3) campsite impacts. All three of these indicators meet characteristics of good indicator variables in that they are measureable, manageable, and are affected by amount and type of recreation use (Manning, 2011). The first indicator variable was the number and type of boats on Lake Champlain. High norm intensities suggest that the number of boats on the lake is important to paddlers in determining the quality of their experience on the lake. Likewise, respondents had moderate to high levels of agreement about the conditions presented. Paddlers rated up to 6.6 motorboats and 8.6 sailboats to be acceptable. At all use levels, sailboats were considered to be significantly more acceptable than motorboats; however, paddlers considered not seeing any other boats to be the optimal condition. Just a small percentage of paddlers (11%) reported that they typically see no other boats on the lake. Rather, the majority of paddlers reported experiencing conditions that are nearing the minimum acceptable condition for both motorboat and sailboat encounters on the lake. Half of survey respondents considered the presence of too many motorboats on the lake to be a “small” problem, a finding reflective of current conditions that, while nearing that which is minimally acceptable, are still within the acceptable range. In contrast, data presented in Table 1 suggest that the presence of other paddle craft on the lake does not currently pose a problem for paddlers, although normative standards for this variable were not measured.

The importance of the natural environment to the paddling experience was at least partially reflected in respondent evaluations of photographs showing different levels of shoreline development. Paddlers rated zero houses along the shore as the optimal condition, evaluating this scenario as very acceptable (mean = 3.7). At the same time, respondents found up to nine houses to be acceptable, and evaluated the photograph with 15 houses as only moderately unacceptable. These findings may relate to the type of houses that were depicted in the photographs. Houses selected for the images were small to moderately sized, representing historical development patterns, and blending in with the larger lake and mountain scenery. During qualitative interviews, some respondents commented on the problematic nature of larger, estate houses, a more recent type of shoreline development not depicted in the study photographs. Additionally, the perspective reflected in the photographs may have been from a greater distance from shore than that often experienced by paddlers. The type of houses represented in the study photographs would appear larger in the landscape from a closer perspective. Despite these potential shortcomings, paddlers expressed moderate to high levels of agreement in their evaluations of the study photographs. The average of eight houses typically seen by paddlers is nearing the minimum acceptable condition for shoreline development.

Paddlers exhibited moderate levels of agreement about the acceptability of environmental impacts at campsites. Recreation ecology research has emphasized the importance of considering both the amount of vegetation loss and the area over which this loss occurs in examining campsite impacts (Cole, 1989). Results from this study suggest that paddlers are able to distinguish among scenarios in which these two types of impacts are varied. Social norm curves for this indicator suggest that campsite size may be a more important variable than vegetation cover. For small campsites, all three vegetation cover levels were evaluated as acceptable. For medium campsites, the lowest level of vegetation cover (12%) was found to be unacceptable. However, when a large campsite was depicted, two of the vegetation cover conditions were found to be unacceptable (55% and 12%). At the same time, relatively low norm intensities suggest that these variables may not be highly important to paddlers. This finding may reflect a lack of camping experience on the part of the survey respondents; only 28% of the sample had camped at a LCPT campsite. Moreover, it is possible that some level of impact could be considered desirable. For example, a campsite may need to be of a certain minimum size to facilitate reasonable use, and be more easily identified from the lake when distinguished by reduced vegetation cover. Ambivalence about campsite conditions is reflected in another study of boaters in the Allagash Wilderness Waterway, ME where visitors were mixed in their evaluations of the importance of natural campsite conditions such as exposed roots, unofficial trails, and damage to trees (Daigle, 2004). The perceptions of the resource conditions mentioned here are examined further in Goonan et al. (2012) and discussed in light of actual ecological conditions measured on the lake shore campsites.

Findings from this study suggest additional indicator variables for which standards could be developed. In particular, paddlers evaluated specific attributes of motorboats as problematic. Motorboat speed and noise emerged as slightly larger problems, while wakes created from motorboats and the smell of engine oil from motorboats were perceived as smaller problems. Alternative study methods, including use of video and audio clips (Manning and Freimuth, 2004; Pilcher et al., 2008), could be employed to measure for standards related to motorboat noise and speed. Likewise, water-based ecological conditions, including algal blooms and water quality, could be examined using photographs or other research methods.

While this study focused on paddlers, there are many recreation user groups that may have an impact on, or be impacted by, paddling on Lake Champlain. The methods used in this study could be applied to understand these groups and the degree to which they share paddler standards for encountering boats on the lake and for seeing shoreline development. In a study of visitors to the St. Croix International Waterway, diverse user groups were found to have different characteristics, visitation patterns, and motivations (Daigle et al., 2003). Successful management of paddling on Lake Champlain will require that the perspectives of other user groups are understood and considered. Similarly, there are paddlers on Lake Champlain who are not members of the LCC who could be sampled through alternative study methods.

Conclusions

Contemporary carrying capacity frameworks rely on formulation of indicators and standards of quality to guide management of outdoor recreation. This study adapted and applied normative and associated visual research methods to help formulate indicators and standards for paddling on Lake Champlain. Normative research has been applied in a growing number of studies in outdoor recreation, and multiple tests of validity (face validity, predictive validity, and construct validity) tend to support that these methods effectively measure public standards for acceptable conditions in parks and related areas (Manning, 2011). Similarly, the visual research methods incorporated in the normative approach have also been used in a number of studies in outdoor recreation and natural resources more broadly and have been found to be “methodologically robust” (Manning and Freimuth, 2004). Findings from this study provide guidance about the range of conditions that may be acceptable to paddlers on a large lake that supports a variety of recreational and other uses. Normative standards were developed for the number and
type of boats on the lake, the amount of shoreline development, and the amount of environmental impact at campsites.

Results from this study indicate that conditions typically experienced by paddlers are nearing the minimum acceptable condition for both the number of motorboats and sailboats on the lake and the amount of shoreline development. These conditions may need to be monitored, and management action may be needed to ensure continued high quality paddling experiences on Lake Champlain. A range of direct and indirect management actions could be used to manage paddling on the lake (Manning, 2011). For example, education and information campaigns could be used to direct paddlers to locations with less shoreline development. Zoning and speed limits could be established to reduce paddler conflicts with motorized boaters. Zoning and subdivision regulations could be designed to control shoreline development. Campsites could be located in areas that are more naturally resistant and resilient and that discourage campsite expansion and proliferation (Daniels and Marion, 2006). Any management actions taken on Lake Champlain will require collaboration among a variety of entities, including lake conservation organizations, state agencies, town governments, and private landowners.

Research methods from an indicators and standards-based framework were successfully applied to understand the characteristics of high quality paddling experiences on Lake Champlain. This research approach provides a systematic way to understand and manage recreational experiences and could be extended to a diversity of freshwater recreational settings. The indicator variables examined here—including crowding, shoreline development, and recreation-related ecological impacts—reflect issues occurring at other large lakes, including the Great Lakes (U.S. EPA, 2006; Buckley, 2004).

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