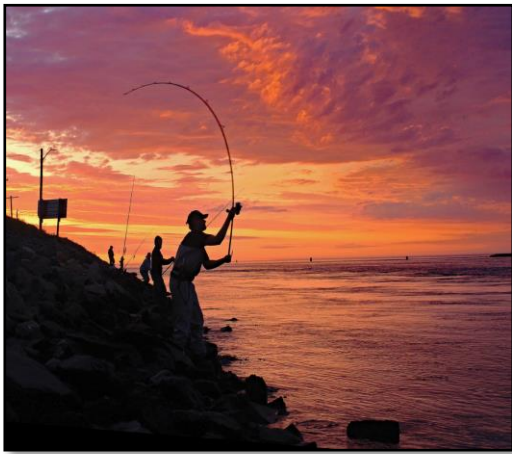

A Carrying Capacity Analysis for Presque Isle State Park: Final Report



Submitted to
Pennsylvania Sea Grant



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Recreation, Park, and Tourism Management
The Pennsylvania State University

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A Carrying Capacity Analysis for Presque Isle State Park: Final Report

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Final Report Submitted to Pennsylvania Sea Grant

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Abstract

This study used a coordinated series of visitor counts and visitor surveys to assess the recreational use of Presque Isle State Park (PISP) and its associated impacts. The study was initiated in spring 2018, with field data collection occurring over a 12-month period during the 2018 and 2019 use seasons. People and vehicles were counted at 12 locations according to a detailed schedule for the year-long data collection period. Interviews with park visitors were conducted concurrently with on-site user counts. Use levels varied widely between the different sites and within each site due to seasonal use pattern variations. Visitor survey data was used to calculate visitation rates (or proportion of visitors using the location) for various sites within the park. The most popular locations within the park were the Perry Monument (visited by 26.8% of visitors) and the West Pier Launch (visited by 21.8%). Visitor counts verified the park is visited most heavily in the summer months, with use dropping sharply in fall and winter, and a moderate numbers of visitors during the spring. The counts also showed an expected pattern of heavier visitation on weekends, with Saturdays receiving more visitors than Sundays. When broken down by time of day, the visitor counts also followed a predictable pattern of few people visiting in the early morning and visitation growing and peaking around mid-day and tailing off over the course of the afternoon. Use levels rebounded and remained relatively high between the hours of 4:00 and 6:00 PM.

The vast majority of PISP visitors are repeat users who tend to visit the park frequently, averaging nearly 40 visits during the past year and 5 visits during the previous month. The majority of visitors interviewed were very satisfied (ratings of 6 or 7 on the 7-point scale) with a variety of park attributes listed noted. Visitors were asked how crowded overall they felt at PISP during their visit and how crowded they felt at the specific site where they were interviewed. Responses to the two questions were very similar, with over two-thirds of responses clustered at the *not at all crowded* end of the continuum (1 or 2 on the 9-point crowding scale). PISP visitors tended to report high scores for how satisfied they were with their experience at the site where they were contacted. PISP visitors reported a variety of behaviors in response to crowding at the state park, the most common being avoiding recreating on holiday weekends (47.7% very frequently), followed by visiting on weekdays to avoid weekends (40.3% very frequently), or arriving earlier or later in the day (37.2% very frequently). Visitors reported encountering varying numbers of other visitors at the site they were interviewed at throughout the year. Regardless of the number of other visitors encountered, the vast majority of visitors (84.4%) rated the encounters acceptable and 63.1% rated them very acceptable.

About half of visitors (50.6%) responding to the survey indicated the number of people at the site visited had no effect on their overall enjoyment. Among those reporting an effect on their enjoyment, visitors were far more likely to indicate a positive effect (46.8% indicating the number of visitors added to their enjoyment) than a negative effect (2.6% indicating the number of visitors reduced their enjoyment). When asked about the maximum number of visitors they would tolerate encountering, over half of the visitors (53.5%) indicated they would visit regardless of the number visitors using the site. A very small segment of visitors (1.3%) indicated they had to wait to find vehicle parking at the site they visited. Among the waiting times reported, the length of time was generally short and acceptable to the visitor, averaging 14.2 minutes with a median of 10 minutes. When asked about a series of potential problems encountered during their visits, almost all of the visitors interviewed (93.3-95.1%) reported the lowest possible rating (1), indicating that none of the conflict and crowding-related issues were problems during their visit.

The visitor capacity analysis focused on interpreting the results of both the visitor use monitoring and visitor surveys to provide insight to the evaluation of the capacity of sites at PISP for recreation. Key visitor impact indicators were compared for various locations within the park, focusing on the most heavily used areas versus a benchmark average of all sites. Results showed few differences between the busiest beach sites and other sites in the park. Overall satisfaction was consistently high across the beach sites and all locations in the park. The acceptability of encounters with others and effects of encounters on enjoyment were uniformly high across all of the sites. The visitor capacity analysis also examined the relationships between various visitor use and impact variables. The visitor use level, represented by the number of visitors encountered, was moderately correlated with overall park ($r=.379$) and site-specific ($r=.373$) crowding measures. However, the encounter level was not significantly related to the visitors' satisfaction level and showed no significant effect on their enjoyment.

A preponderance of evidence suggests that during the study year of September 2018, through August 2019, use levels did not exceed or approach the visitor capacity of the park. Multiple measures of experiential quality showed high ratings and the relationship between the use measures and the indicators of quality were weak or non-significant. Besides these indicators of high quality at the park, other variables shed light on the question of visitor capacity. When asked directly, "What is the *maximum* number of visitors you could encounter at any one time at this specific site in PISP before you would no longer recreate here," the majority of visitors said they would visit regardless of the number of visitors and did not offer a maximum number. Other variables showed strong opposition to visitor use limitations, with 88% opposing placing limits on the number of people who can use PISP at one time and 80% opposing using parking availability to limit the number of visitors who can use the state park. Visitors were also generally supportive of expanding public shuttle transportation to the park.

Although use levels have not reached capacity thresholds in PISP, park management can pursue some actions to possibly improve conditions at the park and avoid approaching or exceeding capacity in the future. For example, park communications could encourage more visitors to adjust the timing of their visits to avoid crowding and could provide on-demand use information such as parking lot occupancy levels through social media, to enable users to better plan their park visits. In addition, further monitoring of selected indicators measured in this study would allow evaluation of potential changes that may develop in the future. Collectively, the information in this report should help give managers and stakeholders further insights that will aid in the sustained health and quality of PISP and the overall outdoor recreation experience.



Section 1. Introduction

Section 1-1. Study Background

With its numerous lakefront, beach and water-based recreation and environmental educational opportunities, Presque Isle State Park has long been recognized as one of Pennsylvania State Parks' crown jewels. It attracts over 4.2 million visitors annually from the local region, the United States, and abroad. The geological and biological diversity of the Park, along with its historical significance to the Erie region, has made the Park an attractive destination for nature enthusiasts and a variety of outdoor recreationists. It is a favorite spot for bird migration and, because of its many unique habitats, has been designated as a National Natural Landmark. Since the late 1990s, several park improvements, expansions, and program efforts have occurred at Presque Isle State Park. Moreover, the contributions of the Park to its local economy and ecology have been enhanced through innovative programming and facility improvements, including construction of the Tom Ridge Environmental Center in 2006.

Presque Isle State Park provides recreation opportunities for a variety of recreation activities and user groups. Proactive management is needed to sustain high quality recreation opportunities and respond to the increasing and dynamic demand for recreation resources in this area. Proactive management requires a systematic and comprehensive system of measurements that will gather information on visitors' opinions about existing recreation services and an understanding of the effects of use levels and patterns on the quality of the recreation experience. In addition, a framework is needed that will help to resolve high intensity recreation use issues within the Park. Of particular concern to managers is the need to resolve conflict and crowding among visitors during peak use periods and at certain locations within the Park. During these periods, visitors may adjust their selection of sites and the activities they participate in to achieve their experience goals and reduce conflicts and crowding with other visitors. Resource managers also need better data to establish a firmer basis for policy and regulatory decisions.

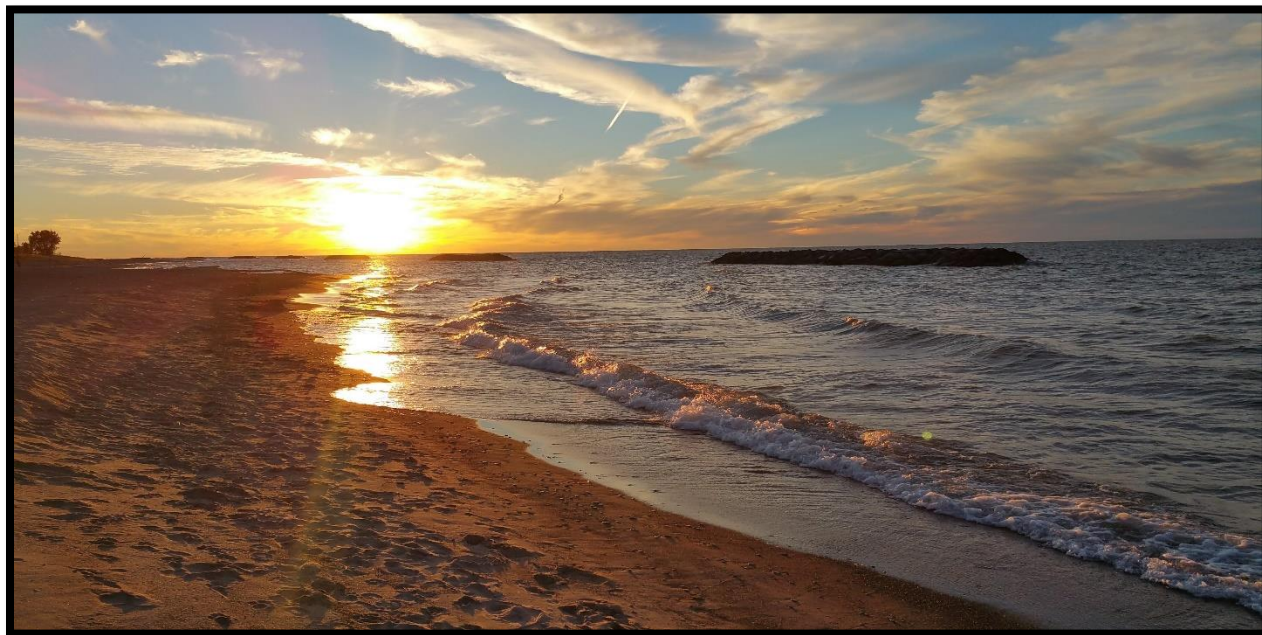
An ideal approach to obtaining this sort of information and analyses is subsumed under the umbrella of recreational carrying capacity research. Therefore, the purpose of this project is to conduct research on the recreational carrying capacity of Presque Isle State Park. The study will provide management guidance for issues related to facility needs, allowable recreational uses, and allocation of use among recreation activities. Processes for estimating the carrying capacity of recreation settings have been used for several decades as a framework for balancing the need for visitor access to natural resources with the need for sustaining high quality recreation opportunities. A substantial amount of research has been conducted to refine carrying capacity assessment techniques. This study builds on that literature and addresses the specific circumstances of Presque Isle State Park.

Section 1-2. Study Objectives

- Obtain an inventory of park use patterns, including observations/visitor counts at designated locations.
- Conduct an on-site survey of current park visitors' characteristics, use patterns, and opinions.
- Produce an analysis of the relationships between use levels and various indicators of quality of the recreation experience.
- Produce a final report that includes the recreational carrying capacity data and analyses, as well as specific managerial guidance based on study results.
- Conduct a series of outreach presentations that communicate study findings and implications, present results at relevant natural resource-related conferences, and publish results in technical proceedings and/or professional journals.

Section 1-3. Study Approach and Methods

This study used a program of coordinated counts of visitors and visitor surveys to assess the recreational use of Presque Isle State Park and its associated impacts. The study was initiated in spring, 2018, with field data collection occurring during the 2018-19 use seasons. A sampling protocol was developed to obtain a statistically valid sample of park users, with error rates not exceeding five percent. Survey instruments were designed to collect data needed for making carrying capacity-related decisions. Comparisons of these characteristics by season and timing of visit were made in order to develop strategies for enhancing the Presque Isle visitor experience. Data collection and analysis for this study focused on key areas and management concerns within the Park such as the beaches, Parry Monument, The Lagoons boat launch, and other various recreation areas. In order for this study to be comprehensive, data for the study encompassed all four seasons of visitor use.



Section 2. PISP Visitation Measurement Results

People and vehicles were counted at 12 locations according to a detailed schedule for the year-long data collection period. Counts were made for a one- or two-hour period depending on the use level and amount of time required to count people and vehicles at the various sites. Each site was counted twice during each sampled period, and the average of the two counts was used as the best estimate of site use. The number of counts completed at the individual sites ranged from 34 to 119 days counted over the study year. Sites receiving more counts included the locations used year-round, whereas sites with fewer counts tended to be locations used only in the summer season (Table 1).

Use levels varied widely between the different sites and within each site due to seasonal use patterns. Beaches 6, 8, and 11 showed the highest levels of use, peaking at 970 visitors at Beach 11 and averaging around 100-150 visitors and 50-80 vehicles during the sampled summer days. Beach 7 and the adjacent Rotary Pavilion also showed relatively high visitation throughout the year. All other sites showed far lower use levels, averaging less than 20 individual visitors and vehicles at one time over the sampling year.

Table 1. Number of visitors and vehicles counted at Presque Isle State Park

Site	Total Visitors		Vehicles		Counts Completed	
	Maximum	Mean	Maximum	Mean	N	%
Beach 6	539	148.4	278	79.1	35	4.5
Beach 8	748	111.6	291	49.1	40	5.2
Beach 11	970	94.8	368	57.3	39	5.1
Beach 7/Rotary Pavilion	300	63.9	153	38.1	109	14.1
Perry Monument	161	20.2	109	16.3	90	11.7
Cookhouse Pavilion	253	14.5	119	20.4	67	8.7
Sunset Point	127	11.9	63	8.7	47	6.1
West Pier Launch	100	6.6	105	18.9	119	15.4
Lagoons Launch	20	4.7	49	18.6	34	4.4
Niagara Launch	21	2.1	45	10.4	72	9.3
Vista 3/Stull Center	11	1.9	43	13.5	81	10.5
Other	70	14.7	56	14.3	39	5.1

Interviews with park visitors were conducted concurrently with the on-site user counts (Table 2). The number of interviews conducted generally conforms to the use patterns of each site. Certain sites with moderate use levels (e.g. Rotary Pavilion, Perry Monument, West Pier Launch) had more interviews conducted because they were visited throughout the year. The busiest beach sites (Beaches 6, 8 and 11) received fewer sampling days and interviews as these sites tended to be used only over the summer season. The visitation rates shown represent the proportion of visitors sampled at all sites who reported visiting each site during their park visit that day. The most popular locations within the park were the Perry Monument (visited by 26.8% of visitors) and the West Pier Launch (visited by 21.8%).

Table 2. Number of interviews completed and visitation rates for sites within Presque Isle State Park

Site	Interviews completed		Visitation Rate (%)
	N	%	
Beach 6	111	8.6	10.1
Beach 8	83	6.4	8.2
Beach 11	84	6.5	7.1
Beach 7/Rotary Pavilion	207	16.1	7.4/15.8
Perry Monument	252	19.6	26.8
Cookhouse Pavilion	106	8.2	11.0
Sunset Point	48	3.7	5.9
West Pier Launch	237	18.4	21.8
Lagoons Launch	31	2.4	4.1
Niagara Launch	34	2.6	3.4
Vista 3/Stull Center	42	3.3	3.3
Other	52	4.0	

The counts recorded verified the expectation that the park is visited most heavily in the summer months, with use dropping sharply in fall and winter (Table 3). The numbers of visitors during the spring increased, but remained far lower than summer use levels. The counts also showed an expected pattern of heavier visitation on weekends, with Saturdays receiving more visitors than Sundays.

Table 3. Visitor Counts by Season and Day of Week (mean values for all sites)

Month	Total Visitors	Vehicles
Winter (December-February)	9.7	8.1
Spring (March-May)	17.6	16.6
Summer ((June-August)	85.9	44.5
Fall (September-November)	6.3	10.1
Day of Week		
Sunday	43.2	30.7
Monday	19.8	11.6
Tuesday	8.3	9.7
Wednesday	16.8	17.2
Thursday	12.7	13.2
Friday	17.2	15.7
Saturday	76.8	35.9
Weekend	48.9	33.3
Weekday	13.6	13.5

When broken down by time of day, the visitor counts also followed a predictable pattern of few people visiting in the early morning and visitation growing and peaking around mid-day and tailing off over the afternoon (Table 4). Use levels rebounded and remained relatively high between the hours of 4:00 and 6:00 PM.

Table 4. Visitor counts by time of day (mean values for all sites).

Time of Day	Total Visitors	Vehicles
8:00-9:00	3.7	4.4
9:00-10:00	4.9	12.1
10:00-11:00	12.5	16.9
11:00-12:00	32.1	26.6
12:00-1:00	56.4	29.2
1:00-2:00	89.3	25.4
2:00-3:00	43.4	33.0
3:00-4:00	36.4	28.2
4:00-5:00	61.1	33.9
5:00-6:00	65.5	39.5

Focusing on selected sites (Table 5), similar patterns of weekday/weekend and time of day visitation were observed. All sites showed much heavier visitation on weekends versus weekdays. Time of day showed different patterns for different types of sites. The popular Beach 6 showed gradual growth of visitation throughout the morning, peaking in early afternoon before dropping sharply in later afternoon. Perry Monument showed more consistent visitation through the day and Beach 7/Rotary Pavilion showed an atypical pattern with heaviest use in the late morning and late afternoon hours.

Table 5. Selected site visitor counts by day of week and time of day (mean values).

Month	Beach 6		Perry Monument		Beach 7/Rotary Pavilion	
	Total Visitors	Vehicles	Total Visitors	Vehicles	Total Visitors	Vehicles
Day of Week						
Weekend	200.7	100.9	28.4	22.2	91.6	51.8
Weekday	83.6	37.3	9.5	8.6	12.0	12.6
Time of Day						
8:00-9:00	---	---	---	---	---	---
9:00-10:00	---	---	2.0	2.0	96	64.0
10:00-11:00	12.0	4.5	14.6	10.2	112.5	61.4
11:00-12:00	144.9	72.6	14.7	12.4	107.8	60.4
12:00-1:00	239.8	108.1	27.6	19.0	25.0	15.1
1:00-2:00	362.0	175.0	19.0	17.0	51.6	33.5
2:00-3:00	396.0	278.0	25.0	23.2	58.0	35.2
3:00-4:00	100.0	55.3	35.5	27.8	52.5	33.4
4:00-5:00	6.0	4.8	NA	NA	70.4	39.4
5:00-6:00	15.0	13.0	53.0	31.0	118.2	67.2

Section 3. PISP Visitor Survey Results

The following section presents the results of the interviews completed with park visitors during the visitor survey portion of the study. The results for all of the survey questions are summarized in data tables with accompanying bullet points highlighting major findings and trends.

Section 3-1. Satisfaction, Management Preferences, and Place Attachment

Table 6. Please indicate your level of satisfaction with the following at PISP today on this trip on a scale from 1-7; 1= *very dissatisfied* and 7= *very satisfied* (%).

	Very Dissatisfied		Neither			Very Satisfied		Mean
Conditions of restrooms	1.4	4.9	5.7	31.7	14.3	27.9	14.2	4.93
Restroom availability	2.9	4.2	2.9	10.0	7.5	45.0	27.6	5.00
Condition of parking areas	3.0	5.0	3.8	1.8	8.4	47.1	30.8	5.72
Parking availability	2.0	3.1	2.4	1.5	6.9	47.3	36.7	5.97
Traffic on park roads	5.8	14.0	3.5	1.9	9.0	33.2	32.7	5.24
Condition of beaches	0.9	1.6	3.2	41.1	8.4	28.2	16.6	5.06
Adequacy of park signage	2.9	5.6	3.9	4.0	6.7	45.0	32.0	5.69
Availability of rangers and park staff	2.3	3.6	2.2	18.0	6.9	42.5	24.5	5.49

- The majority of visitors interviewed were very satisfied (ratings of 6 or 7 on the 7-point scale) with most of the park attributes listed in the survey.
- Visitors gave the highest satisfaction ratings for the availability and condition of parking areas (mean values of 5.97 and 5.72, respectively), followed closely by adequacy of park signage (mean = 5.69).
- Visitors reported the lowest satisfaction with the condition of restrooms (mean = 4.93), followed by the condition of beaches (mean = 5.06).

Table 7. Please indicate how satisfied you were with your experience **at this specific site** in PISP today on a scale from 1-7; 1= *poor* and 7= *perfect*.

	N	%
1	5	.5
2	5	.5
3	17	1.6
4	96	8.9
5	142	13.2
6	533	49.5
7	279	25.9
Total	1077	100.0
	Mean = 5.86	Median = 6

- PISP visitors tended to report high scores for how satisfied they were with their experience at the site where they were contacted.
- Over three-fourths (75.4%) of the visitors reported satisfaction ratings of 6 or 7 on the 7-point scale.

Table 8. Please indicate the extent to which you agree or disagree with each of the following statements at PISP on a scale from 1-7; 1= *strongly disagree* and 7= *strongly agree* (%).

	Strongly disagree		Neutral			Strongly agree		Mean
I thoroughly enjoyed my visit to PISP today	.2	.4	.2	.8	3.0	44.8	50.6	6.43
I cannot imagine a better trip to PISP	.4	1.2	2.5	6.3	9.1	42.2	38.4	6.03
My trip was well worth the money I spent to take it	.6	.1	.3	5.8	4.0	44.0	45.2	6.25
To improve the experience, limits should be placed on the number of visitors who can use PISP at any one time	69.6	19.5	1.6	4.1	1.7	1.9	1.7	1.61
There should be no limits on the number of visitors allowed to use PISP at any one time	3.8	2.4	1.1	3.7	1.5	20.9	66.7	6.26
To improve the experience, parking availability should be used to limit the number of visitors who can use PISP	61.2	18.6	1.9	7.1	3.6	4.7	2.9	1.99
Public shuttle transportation services onto PISP should be expanded	7.5	6.0	1.7	27.4	10.4	23.2	23.7	4.92
PISP means a lot to me	1.0	1.9	.6	7.0	5.1	45.3	39.0	6.05
I enjoy recreating at PISP more than other places I could visit	3.8	5.5	2.7	11.6	5.1	43.6	27.6	5.50
I am very attached to PISP	2.3	4.8	1.7	10.7	5.1	40.8	34.7	5.73
I get more satisfaction out of visiting PISP than from visiting most places	4.2	7.6	3.1	14.2	6.3	39.4	25.1	5.29

- Visitors were asked a series of questions about their trip to PISP and their feelings about the state park. Responses to the satisfaction-related items showed very high levels of satisfaction with park visits (80.6-95.4% strongly agree).
- Responses to two capacity-related questions showed strong opposition to imposing limits on numbers of park visitors (87.6% strongly agree limits should not be set) and using parking to limit the number of visitors (79.8% strongly disagree).
- The majority of visitors interviewed supported the idea that public shuttle transportation services to PISP should be expanded (46.9% strongly agree).
- Four questions dealing with visitors’ feelings towards PISP showed strong levels of place attachment. Most of the visitors (84.3%) stated that PISP means a lot to them and they are very attached to PISP (75.5%). About two thirds of visitors reported they enjoy recreating at PISP more than other places they could visit (71.2%) and they get more satisfaction out of visiting PISP than from visiting most places (64.5%).

Section 3-2. Activity Participation

Visitors were shown a list of recreation activities and asked which activities they had participated in (or planned to participate in) during their visit, as well as their primary activity at the park that day (Table 9).

Table 9. Activity Participation

	Activity Participation*		Primary Activity ⁺	
	N	%	N	%
Inland activities (walking, running, biking, picnicking, playgrounds, pavilions, etc.)	409	37.7	351	32.4
Beach activities (sunbathing, walking, relaxing, shell collecting, volleyball, etc.)	348	32.1	302	27.8
Angling from shore, pier, dock, etc.	302	27.8	300	27.6
Lake activities (swimming, wading, surfing, boogie boarding, snorkeling, etc.)	113	10.4	38	3.5
Angling from a private or commercial boat	35	3.2	34	3.1
Motorized pleasure boating (boating, boat touring, jet skiing, tubing, water skiing, etc.)	35	3.2	32	2.9
Non-motorized pleasure boating (wailing, kayaking, SUP, canoeing, paddle boating, etc.)	30	2.8	28	2.6

* Results do not add to 100% because visitors could participate in multiple activities.

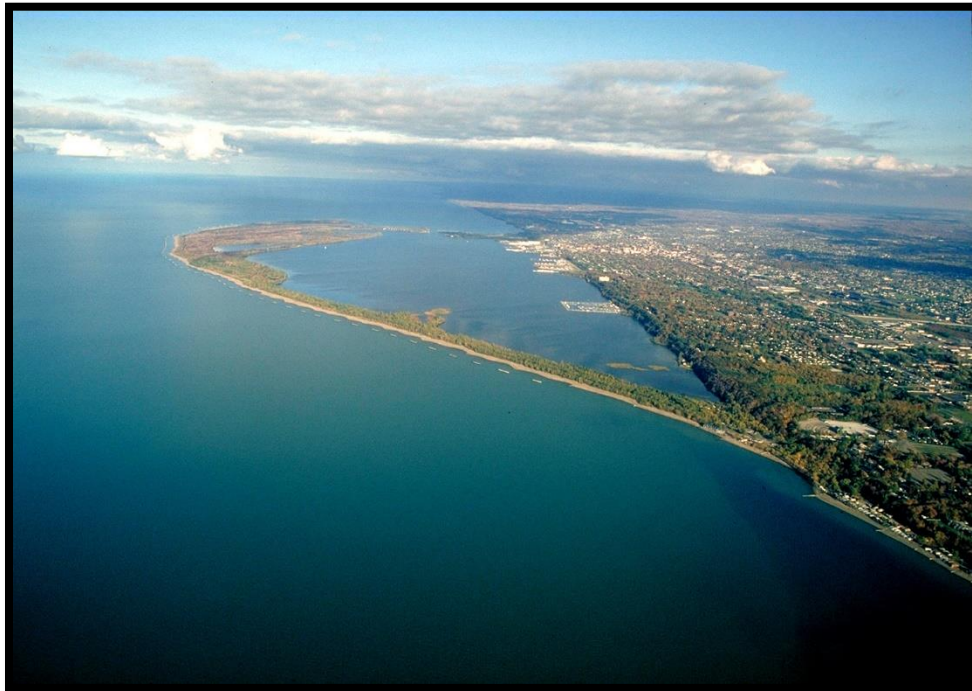
- The dominant activity at Presque Isle State Park is inland activities including walking, running, biking, picnicking, use of playgrounds, pavilions, etc., reportedly participated in by 37.7% of visitors and as the primary activity by 32.4% of users.
- Beach activities including sunbathing, walking on the beach, relaxing, shell collecting, volleyball, etc. were reported by almost one-third (32.1%) of visitors and as the primary activity of over one-fourth (27.8%) of visitors.
- Over one-fourth of visitors surveyed reported participating (27.8%) in angling from shore, a pier, dock, etc. and as their primary activity (27.6%).
- About one-tenth of visitors (10.4%) reported participating in lake activities like swimming, wading, surfing, boogie boarding, and snorkeling during their park visit, with 3.5% reporting these as their primary activities.
- Other recreation activities, including angling from a boat and motorized and non-motorized boating, were practiced by smaller segments (around 3%) of visitors.

Section 3-3. Site Preferences

Table 10. Which of the following sites did you visit or do you intend to visit while at PISP today on this trip?

Site	N	%	Site	N	%
Beach 1	7	0.6	East Pier	14	1.2
Barracks Beach	1	0.1	North Pier	56	5.2
Beach 6	110	10.1	Multipurpose Trail	40	3.7
Beach 7	80	7.4	Vista 1	5	0.5
Beach 8	89	8.2	Vista 2	2	0.2
Tom Ridge Environmental Center	7	0.6	Vista 3	36	3.3
Mill Rd Beaches	3	0.3	PI Lighthouse	85	7.8
Beach 9	2	0.2	Sunset Point	64	5.9
Beach 10	14	1.3	Rotary Pavilion	171	15.8
Beach 11	77	7.1	Cookhouse Pavilion	119	11.0
PISP Marina	25	2.3	Picnic Pavilions	3	0.3
Lagoons Launch	44	4.1	Gull Point Nat Area	2	0.2
Niagara Launch	37	3.4	Perry Monument	291	26.8
West Pier Launch	236	21.8			

- When asked which sites they visited or intended to visit in the State Park that day, responses ranged from only a few responses to many responses for popular sites in the park.
- Over one-fourth of visitors surveyed reported visiting Perry Monument (26.8%) and over one-fifth visited West Pier Launch (21.8%), which were the two most popular locations within the park among sampled visitors.
- Other popular sites receiving visits from many people included Rotary Pavilion (15.8%), Cookhouse Pavilion (11.0%), and Beach 6 (10.1%).



Section 3-4. Group Characteristics

Table 11. How many people are in your group today?

	Number of Adults		Number of Children	
	N	%	N	%
0	---	---	871	81.2
1	300	28.0	75	7.0
2	597	55.7	76	7.0
3-4	133	12.4	39	3.6
5-10	28	2.6	9	0.8
More than 10	14	1.3	2	0.2
Total	1072	100.0	1072	98.8
Average	2.3		2.3	

- Park visitors come in a variety of group sizes, averaging 2.3 people per group.
- Over one-fourth of the visitors surveyed (28.0%) were at the park alone.
- Over one-half of the visitors surveyed (55.7%) were in a group of two people
- Over one-tenth of the visitors surveyed (12.4%) were in a group of 3-4 people, with another 3.9% in groups of five or more people.
- Less than one-fifth (18.8%) of the visitor groups included at least one-child, with an average of 2.3 children per group.

Table 12. Experience Use History

Type of Visitor	N	%
First time visitor	123	11.3
Repeat visitor	963	88.7
Repeat Visitor Behavior		
Total years of previous visitation		
10 years or less	227	23.3
11-20 years	131	13.4
21-30 years	131	13.4
31-40 years	148	15.2
41-50 years	129	13.2
Greater than 50 years	208	21.4
Number of years visiting PISP for outdoor recreation activities		
	Mean = 3.3	Median = 30
Number of days spent at PISP in the last year		
	Mean = 39.7	Median = 12
Number of days spent at PISP in the last month		
	Mean = 4.8	Median = 3

- The vast majority (88.7%) of Presque Isle State Park visitors are repeat users who have been to the park before.
- The other 11.3% are first-time visitors, which is typical for a Pennsylvania State Park.
- Among the repeat visitors, nearly one-quarter (23.3%) had 10 years or less previous experience at the State Park, while another one-fifth (21.4%) had over 50 years of previous visitation history at the park.
- Presque Isle State Park visitors tend to visit the park frequently, averaging nearly 40 visits during the past year and 5 visits during the previous month.

Section 3-5. Transportation Preferences

Table 13. What was your primary mode of transportation for accessing PISP today?

	N	%
Personal vehicle	971	90.6
Walking, hiking, etc.	1	.1
Bicycle, scooter, etc.	98	.1
Water taxi	1	9.1
Public transport shuttle	1	.1
Total	1072	100.0

- The vast majority of visitors (90.6%) responding to the survey arrived at the park in a personal vehicle.
- About one-tenth of visitors (9.1%) traveled to the park via bicycle, scooter, etc.
- Very few visitors (< 1%) came to the park using other modes of transportation including walking, private boat or water taxi, and the public transport shuttle.



Section 3-6. Crowding and Capacity Perceptions

Table 14. Please indicate the level of crowding you experienced at PISP today on a scale from 1-9; 1= not at all crowded and 9= extremely crowded.

Crowding Score	Overall trip crowding		Site-specific crowding	
	N	%	N	%
1	548	50.8	577	53.4
2	197	18.3	196	18.1
3	73	6.8	70	6.5
4	113	10.5	103	9.5
5	22	2.0	16	1.5
6	78	7.2	79	7.3
7	32	3.0	22	2.0
8	10	.9	12	1.1
9	6	.6	5	.5
Mean	2.36		2.26	

- Visitors were asked how crowded overall they felt at PISP during their visit and how crowded they felt at the specific site where they were interviewed.
- Responses to the two questions were very similar, with over two-thirds of responses clustered at the not at all crowded end of the continuum (1 or 2 on the 9-point crowding scale).

Table 15. We would like to know more about your behaviors related to crowding. Please indicate how frequently you have ever done the following due to crowding at PISP on a scale from 1-7; 1= never and 7= very frequently.

	Never		Occasionally			Very Freq		Mean
Recreated earlier or later in the day	26.2	17.9	2.1	12.0	4.6	25.4	11.8	3.74
Recreated earlier or later in the year	37.2	19.5	3.1	8.8	4.6	18.0	8.7	3.13
Recreated on weekdays to avoid weekends	29.9	15.2	2.3	8.0	4.3	23.9	16.4	3.79
Avoided recreating on holiday weekends	26.9	14.2	2.4	5.2	3.6	24.1	23.6	4.11
Recreated at a different location within PISP	38.6	24.7	2.9	14.3	3.7	10.8	5.0	2.72
Recreated at a different location outside PISP	51.4	29.6	2.5	7.0	1.8	5.8	1.9	2.03
Changed your recreation activity	56.1	30.2	1.2	4.9	1.7	4.1	1.7	1.85
Abandoned your recreation experience altogether	61.6	28.7	1.6	3.3	.5	2.5	1.8	1.67

- PISP visitors reported a variety of behaviors in response to crowding at the state park. The most common response was to avoid recreating on holiday weekends (47.7% very frequently).
- Visitors were also likely to visit on weekdays to avoid weekends (40.3% very frequently) or arrive earlier or later in the day (37.2% very frequently).
- Some visitors reported choosing another location within PISP due to crowding, although the majority (63.3%) never moved to another location within the park.
- The majority of visitors responding to the survey indicated that they never changed their location to a site outside of PISP or changed their recreation activity or abandoned their recreation experience altogether.

Table 16. About how many other visitors *did you encounter at any one time at this specific site in PISP today?*

	N	%
5 or less	196	19.3
6-10	171	16.8
11-20	156	15.3
21-30	110	10.8
31-50	103	10.1
51-100	107	10.5
More than 100	175	17.2
Total	1018	100.0
	Mean = 93.1	Median = 25

- Visitors reported encountering varying numbers of other visitors at the site they were interviewed at throughout the year.
- About one-fifth of the visitors (19.3%) reported seeing 5 or less other visitors and over one-third (36.1%) reported encountering 10 or less other visitors.
- At the other end of the spectrum, over one-third (37.7%) reported seeing over 50 visitors and nearly one-fifth (17.2%) reported encountering more than 100 visitors.

Table 17. Previously, you noted how many visitors you encountered at any one time at this specific site in PISP today. Please rate the acceptability of those encounters on a scale from 1-7; 1= *very unacceptable* and 7= *very acceptable*.

	N	%
Very unacceptable	32	3.0
Unacceptable	6	.6
Slightly unacceptable	9	.8
Neither	97	8.9
Slightly acceptable	25	2.3
Acceptable	231	21.3
Very acceptable	684	63.1
Total	1084	100.0
	Mean = 6.23	Median = 7

*Correlation between site number encountered and acceptability = $-.068$, $p = .031$

- Regardless of the number of other visitors encountered, the vast majority of visitors (84.4%) responding to the survey rated the encounters acceptable and 63.1% rated them very acceptable.
- Very few (4.8%) of respondents rated the number of visitors encountered as unacceptable.

Table 18. How did the number of people at any one time at this specific site in PISP affect the overall enjoyment of your trip today?

	N	%
Added a lot to my enjoyment	407	37.9
Added a little to my enjoyment	96	8.9
Had no effect to my enjoyment	543	50.6
Detracted a little from my enjoyment	22	2.1
Detracted a lot from my enjoyment	5	0.5
Total	1073	100.0

- About half of visitors (50.6%) responding to the survey indicated the number of people at the site visited had no effect on their overall enjoyment.
- Among those reporting an effect on their enjoyment, visitors were far more likely to indicate a positive effect (46.8% indicating the number of visitors added to their enjoyment) than a negative effect (2.6% indicating the number of visitors reduced their enjoyment).

Table 19. What is the *maximum* number of visitors you could encounter **at any one time at this specific site** in PISP before you would no longer recreate here?

	N	%
25 or less	42	8.5
26-50	88	17.7
51-100	124	24.9
101-200	158	31.8
More than 200	85	17.1
Total	497	100.0
	Mean = 170.8	Median = 100

*Note: 497 visitors answered Max # question

*Note: 572 selected I would visit regardless of use (53.5%)

- When asked about the maximum number of visitors they would tolerate encountering, over half of the visitors (53.5%) responding to the survey indicated they would visit regardless of the number visitors using the site.
- Among those who volunteered a number, about one-quarter said 50 or less (26.2%) or 51-100 (24.9%), and almost half (48.9%) reported more than 100 visitors as a maximum.
- The mean number of visitors reported as a *maximum* number of visitors people could encounter at any one time at this specific site in PISP before they would no longer recreate there was 170.8 visitors, with a median of 100.

Table 20. We would like to know more about your opinions of encountering other visitors. Please rate the acceptability of encountering [a number of] other visitors at any one time at this specific site in PISP today on a scale from 1-7; 1= very unacceptable and 7= very acceptable.

	Very Unacceptable		Neither			Very Acceptable		Mean
0-25 visitors encountered at any one time	0.7	0.6	0.7	1.1	1.8	42.8	52.3	6.40
26-50 visitors encountered at any one time	2.4	1.8	1.0	1.8	3.5	46.3	43.2	6.14
51-100 visitors encountered at any one time	5.6	6.6	4.8	2.5	7.8	43.9	28.7	5.47
101-200 visitors encountered at any one time	15.1	19.3	8.2	3.9	9.3	25.9	18.3	4.24
201+ visitors encountered at any one time	28.2	18.7	5.7	4.4	6.6	21.4	15.1	3.67

- When asked about the acceptability of encountering varying numbers of visitors, respondents showed a predictable pattern of lowering rates of acceptability for increasing numbers of visitors.
- Rates of acceptability remained high for up to 100 visitors, with 95.1% very acceptable for up to 25 visitors, 89.5% very acceptable for 26-50 visitors, and 72.6% very acceptable for 51-100 visitors.
- The ratings dropped noticeably for levels above 100 visitors, with 44.2% rating 101-200 visitors very acceptable and just 36.5% rating over 200 visitors very acceptable.

Table 21. Did you have to wait to find vehicle parking at this specific site in PISP today?

	N	%
No	1052	98.7
Yes	14	1.3
Reported waiting time	Mean = 14.2 minutes	Median = 10
Waiting time acceptable	Yes = 53.8%	No = 46.2%
Maximum waiting time	Mean = 27.9 minutes	Median = 30

- A very small segment of the visitors (1.3%) responding to the survey indicated they had to wait to find vehicle parking at the site they visited.
- Among the waiting times reported, the length of time was generally short, averaging 14.2 minutes with a median of 10 minutes.
- Among those reporting waiting for parking, over half (53.8%) said the waiting time encountered was acceptable.
- When asked how long of a wait is acceptable, the responses averaged about half an hour, with a mean of 27.9 minutes and a median of 30 minutes.

Table 22. Please indicate the extent that the following issues were problems for you at this specific site in PISP today on a scale from 1-7; 1= not a problem and 7= major problem.

	Not a problem		Minor Problem			Major Problem		Mean
Conflict from other visitors	95.1	3.6	.4	.3	.4	.3	---	1.08
Visitors not following rules	93.3	4.1	.3	.8	.5	.8	.2	1.14
The actions or behaviors of other visitors	93.4	4.1	.3	.7	.5	.8	.2	1.14
Crowds and crowding	93.6	4.6	.9	.4	.2	.1	.2	1.10
Too many other visitors	94.4	4.7	.4	.2	.2	---	.2	1.08
Large groups of visitors	94.0	4.6	.7	.2	.3	.2	---	1.09

- When asked about a series of potential problems encountered during their visits, almost all of the visitors interviewed (93.3-95.1%). reported the lowest possible rating (1), indicating that none of these conflict and crowding-related issues were problems during their visit.

Section 3-7. Socio-Demographics

Table 23. Gender of respondent.

	N	%
Male	652	61.3
Female	409	38.4
Non-Binary	3	.3
Total	1084	100.0

- Survey respondents were more likely to be male (61.3%) than female (38.4%).

Table 24. Age of respondent.

	N	%
Under 30	115	10.7
30-39	140	13.0
40-49	159	14.8
50-59	225	20.9
60-60	282	26.3
70 or above	153	14.2
Total	1074	99.9
	Mean = 52.7	Median = 55

- The age of respondents ranged from 18 to 92, with a mean of 52.7 and a median of 55.
- About one-quarter of the respondents (23.7%) were under the age of 40, while over half (61.4%) were 50 or older.

Table 25. How many miles from home did you travel to this site?

	N	%
5 or less	171	16.0
6-10	218	20.4
11-25	155	14.5
26-50	59	5.5
51-100	137	12.8
101-200	236	22.0
More than 200	95	8.9
Total	1071	100.0
	Mean = 93.1	Median = 25

- PISP visitors included many living very close to the park and others traveling varying distances to visit the park.
- About one-third of those surveyed (36.4%) traveled 10 miles or less to visit the park, while another one-third (30.9%) traveled over 100 miles.
- The mean traveling distance was 93.1 with the median 25 miles.

Table 26. How would you describe the area in which you live?

	N	%
Urban	273	26.0
Suburban	506	48.2
Rural	270	25.7
Total	1050	99.9

- About half of the respondents (48.2%) reported living in a suburban environment.
- One-quarter of the visitors live in urban environments (26.0%) or rural settings (25.7%).

Table 27. In what income category does your household fall?

	N	%
Under \$25,000	70	8.6
\$25,000-49,999	191	23.5
\$50,000-74,999	209	25.7
\$75,000-99,999	162	20.0
\$100,000-149,999	124	15.3
\$150,000 or greater	56	6.9
Total	812	100.0

- Income levels of park visitors varied widely, with about one-third (32.1%) reporting annual incomes of under \$50,000 and one-quarter (22.2%) reporting incomes of \$100,000 or more.

Table 28. With which racial group do you most closely identify?

	N	%
White	1041	96.1
Black/African American	26	2.4
Spanish/Hispanic/Latino	6	.6
Asian	7	.6
Middle Eastern or North African	3	.3
Total	1083	100.0

- Almost all of the visitors interviewed (96.1%) reported their racial identity as white.

Table 29. What is the highest level of formal schooling you have completed?

	N	%
Less than high school		
Some high school	29	2.7
High school graduate	307	28.4
Some college	127	11.8
2 year college	122	11.3
4 year college	291	26.9
Graduate/professional degree	204	18.9
Total	1080	100.0

- Education levels of park visitors varied widely, with about one-third (31.1%) reporting a high school education and almost one-half (45.8%) reporting a 4 year college degree or graduate/professional degree.

Table 30. Which of the following best describes your political orientation?

	N	%
Extreme liberal	21	2.0
Very liberal	120	11.3
Slightly liberal	190	17.8
Moderate	344	32.3
Slightly conservative	205	19.2
Very conservative	160	15.0
Extreme conservative	25	2.3
Total	1065	99.9

- Park visitors included those with all political orientations and were almost evenly divided among liberals and conservatives.
- About one-third of respondents (32.3%) reported themselves a moderate, with another one-third leaning toward liberal (31.1%) and slightly more (36.5%) leaning conservative.



Section 4. Summary and Conclusions

Section 4-1. Visitor Capacity Analysis

The following analysis focuses on considering the results of both the visitor use monitoring and visitor surveys that provide insight to the evaluation of the capacity of sites at Presque Isle State Park for recreation. It also incorporates analysis of the relationships between the measures of visitor use and the impacts of that use on the quality of the visitor experience.

The first step in the visitor capacity analysis involved comparing the key visitor impact indicators at various locations within the park. Focusing on the most heavily used areas versus a benchmark average of all sites, Table 31 shows little difference between the busiest beach sites and other sites in the park. Overall satisfaction was consistently high across all beach sites and all locations in the park. Although reported numbers of encounters with visitors at Beaches 6, 8, and 11 were much higher than for other sites, the overall and site-specific crowding measures were only slightly higher and were still relatively low on the 9-point crowding scale. Responses from visitors at the Beach 7/Rotary Pavilion location were more consistent with all sites, reflecting the year-round use of this location in the park.

More importantly, the acceptability of encounters with others and effects of encounters on enjoyment were uniformly high across all of the sites. Visitors at Beach 6 and Beach 8 were even more likely to indicate they would visit regardless of the use level (70-71%) than users of the other sites (53-54%). Among those offering a number of visitors they would tolerate seeing at the site at any one time, users at Beaches 6, 8, and 11 suggested an average value of about 350 visitors.

Table 31. Summary of crowding-related impacts for selected sites.

	All Sites	Beach 6	Beach 7/ Rotary	Beach 8	Beach 11
Satisfaction Rating ¹	5.9	5.9	5.9	6.1	5.6
Overall Park Crowding ²	2.4	3.1	2.5	2.8	2.8
Site Crowding ²	2.3	3.0	2.5	2.6	2.7
Number of visitors encountered	68	266	79	139	118
Acceptability of encounters ³	6.2	6.2	6.3	6.1	6.5
Encounters reduced enjoyment	3%	2%	4%	0%	2%
Would visit regardless of use level	54%	70%	53%	71%	53%
Maximum number of visitors tolerable	171	360	183	342	348

¹ Measurement scale: 1= *poor* to 7= *perfect*.

² Measurement scale: 1= *not at all crowded* to 9= *extremely crowded*.

³ Measurement scale: 1= *very unacceptable* to 7= *very acceptable*.

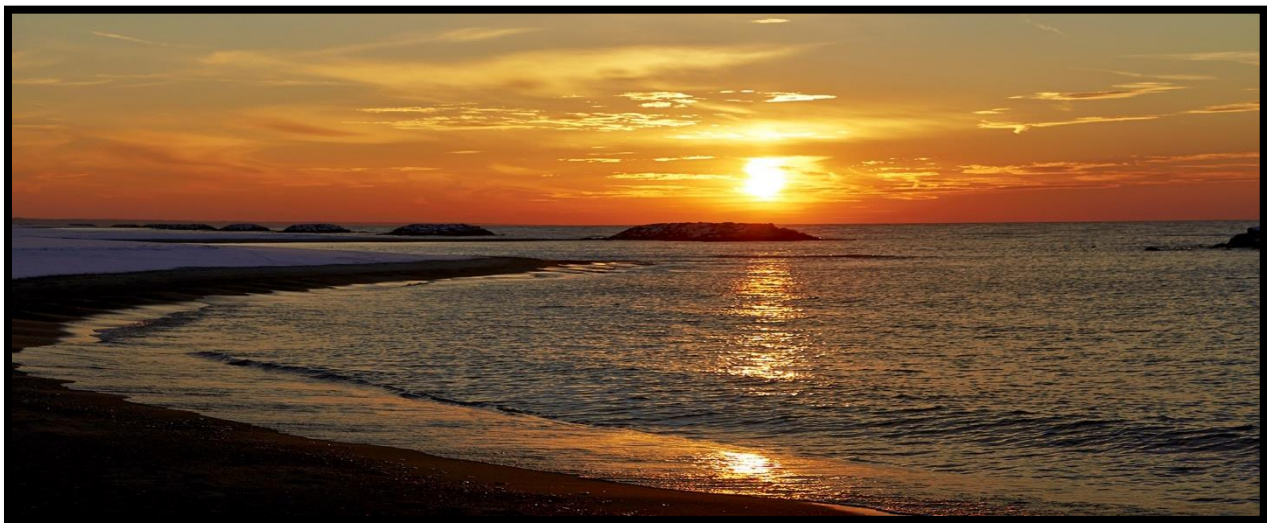
The next step in the visitor capacity analysis involved examining the relationships between the various visitor impact variables (Table 32). The visitor use level, represented by the number of visitors encountered, was moderately correlated with overall park ($r=.379$) and site-specific ($r=.373$) crowding measures. In other words, respondents seeing more visitors did tend to report higher crowding scores. However, the encounter level was not significantly related to visitor satisfaction level and showed no significant effect on their enjoyment. Those encountering more visitors also reported higher tolerance for seeing other visitors ($r=.606$).

The two measures of crowding (overall and site-specific) were strongly correlated to each other ($r=.883$), but were weakly correlated to trip satisfaction ($r=-.127$ and $-.113$) and effect on enjoyment ($r=.168$ and $.129$). In other words, those visitors feeling more crowded also tended to show a higher tolerance for the maximum number of visitors they could encounter before they would no longer recreate at the site ($r=.220$ and $.254$).

Table 32. Correlations between crowding-related impact indicators

	Number of visitors encountered	Overall Park Crowding	Site Crowding	Satisfaction Rating	Acceptability of encounters ³	Encounters reduced enjoyment	Maximum number of visitors tolerable
Number of visitors encountered	1						
Overall Park Crowding ²	.379**	1					
Site Crowding	.373**	.883**	1				
Satisfaction Rating	-.002ns	-.127**	-.113**	1			
Acceptability of encounters ³	-.068*	-.032ns	.040ns	-.005	1		
Encounters reduced enjoyment	.006ns	.168**	.129**	-.077*	-.116**	1	
Maximum number of visitors tolerable	.606**	.220**	.254**	.077ns	-.029ns	.054ns	1

* $p < .05$ ** $p < .01$



Section 4-2. Summary and Conclusions

A preponderance of evidence suggests that during the study season of September 2018 through August 2019, use levels did not exceed or approach the visitor capacity of the park. Multiple measures of experiential quality showed high ratings and the relationship between use measures and the indicators of quality were weak or non-significant. More specifically, the following highlights from the results document this conclusion:

- Measures of crowding, both at the site visited and for the park overall, were exceptionally low.
- Measures of satisfaction were extremely and uniformly high across locations in the park.
 - These included an overall satisfaction rating as well as several additional indicators of trip enjoyment, perception of the visit being worth the money spent on it, and the perception that the respondent could not imagine a better trip to the state park.
- Visitors expressed strong acceptance of the numbers of visitors they encountered at the park.
 - Very few visitors reported a reduction in their satisfaction, with about half indicating the number of people had no effect on their enjoyment and the other half much more likely to report that the number of other visitors increased rather than decreased their enjoyment.
- Responses to a series of questions about potential crowding and conflict problems showed extremely low levels of problems encountered by visitors.
- There was almost no waiting to find parking spaces at sites within the park, and the few visitors who reported waiting for parking expressed short and acceptable wait times.

Besides these indicators of high quality at the state park, other variables directly or indirectly addressed the question of visitor capacity. For example, many visitors reported voluntary behaviors related to crowding they have pursued, with about half of them avoiding visiting on holiday weekends and about 40% avoiding weekends or adjusting the timing of their visit to earlier or later in the day. When asked directly, “What is the *maximum* number of visitors you could encounter at any one time at this specific site in PISP before you would no longer recreate here,” the majority of visitors said they would visit regardless of the number of visitors and did not offer a maximum number. Other questions showed strong opposition to visitor use limitations, with 88% opposing placing limits on the number of people who can use PISP at one time and 80% opposing using parking availability to limit the number of visitors who can use the state park. Visitors were also generally supportive of expanding public shuttle transportation to the park.

In conclusion, these findings suggest that use levels have not exceeded, nor even approached, capacity thresholds in Presque Isle State Park. Park management can, however, pursue some actions to possibly improve conditions at the park and avoid approaching or reaching capacity in the future. For example, park communications could encourage more visitors to adjust the timing of their visits to avoid crowding and could provide on-demand use information such as parking lot occupancy levels through social media to enable users to better plan their park visits. In addition, further monitoring of selected indicators measured in this study would allow evaluation of potential changes that may develop in the future. Collectively, the information in this report should help give managers and stakeholders further insights that will aid in the sustained health and quality of Presque Isle State Park.

Appendix A. Staff, Students Supported, and Outreach/Extension

Two undergraduate students, three graduate students, two full-time faculty, two full-time employees, and one part-time employee were employed on this project. Study results informed the development of the undergraduate and graduate student research and scholarship. The following is a description of the staff, support, and outreach.

a. Students Supported

- i. Number of Undergraduate Students = 2
 - Ms. Meghan Palko
 - Ms. Katrina Schoemaker
- ii. Number of Graduate Students = 3
 - Mr. Thomas Mueller
 - Mr. Jordan Blair
 - Ms. Aubrey Talon
- iii. Degrees Awarded = 1

b. Staff

- i. Number of full-time faculty = 2
 - Dr. Alan Graefe
 - Dr. Michael Ferguson
- ii. Number of full-time employees = 2
 - Ms. Susan Gamble
 - Mr. John Maloney
- iii. Number of part-time employees = 1
 - Mr. Thomas Cermak

c. Publications

- i. Total publication = 0

d. Volunteer Hours

- i. Total volunteer hours = 0

e. Outreach/Extension

- i. Number of meetings, workshops, or conferences, and number of attendees = 0 (*Meetings deferred due to COVID-19 pandemic)

Appendix B. Impact Statement

Determining visitor capacities of public parks and protected areas has been a long-standing research issue over the past 50 years. Extensive research has been conducted in areas suspected to be suffering from overuse and capacity-related problems. This research has been synthesized in several review articles, and methodological advances have occurred over the years, with several visitor management frameworks developed to address visitor use and capacity issues. This study builds upon and extends this body of research.

This study assessed visitor use and the quality of the recreation experience at Presque Isle State Park, a popular Pennsylvania State Park with suspected issues of overuse. Contrary to the question of potential overuse, study results showed a high quality recreation experience received by nearly all park visitors. The park does not appear to have reached or even approached its visitor capacity. Multiple indicators of experiential quality showed high levels of satisfaction and enjoyment by visitors, regardless of the levels of use encountered. Crowding-related impacts were minimal across all sites in the park, including the heaviest used beaches in the summer season.

These results verify the park is providing valuable services to the public, which can be expected to continue into the future. This study also includes some management implications which may assist State Park managers to develop strategies short of use limitations to further improve the quality of the visitor experience in Presque Isle State Park. Use levels and impact indicators should be monitored at periodic intervals in the future to allow evaluation of potential changes that may occur over time. Collectively, the information in this report should help give managers and stakeholders further insights that will aid in the sustained health and quality of Presque Isle State Park.

Appendix C. Survey Instrumentation

Date: _____ Time: _____ Location: _____ Interviewer: _____

--Presque Isle State Park Carrying Capacity Study--

Hello, my name is _____. I'm with Penn State and we are doing a survey of visitors to the Presque Isle State Park. The information collected will help Presque Isle State Park (PISP) better serve its visitors. Your participation is voluntary and all information will be kept confidential.

1. Which of you has had the most recent birthday and is at least 18 years of age? [Focus all questions towards **that user**]
2. May I have about 10-15 minutes of your time to complete this survey? ___ Yes ___ No
 - a. [If *NO*] Why not? _____
3. [*FC*] Which of the following activities did you participate in during **this trip** to PISP? [Select **ALL** that apply].
4. [*FC*] Which **one** of those activities was your *primary activity* during **this trip** to PISP? [Select **ONE** option].

Q3 Answer		Q4 Answer
	Angling from a private or commercial boat	
	Angling from shore, pier, dock, etc.	
	Motorized pleasure boating (boating, boat touring, jetskiing, tubing, waterskiing, etc.)	
	Non-motorized pleasure boating (sailing, kayaking, SUP, canoeing, paddle boating, etc.)	
	Beach activities (sunbathing, walking, relaxing, shell collecting, volleyball, etc.)	
	Lake activities (swimming, wading, surfing, boogie boarding, snorkeling, etc.)	
	Inland activities (walking, running, biking, picnicking, playgrounds, pavilions, etc.)	

5. [*FC*] What was your **primary** mode of transportation for accessing PISP today? [Select **ONE** option].
 ___ Personal vehicle ___ Walking, hiking, etc. ___ Motorized boat ___ Public transport shuttle
 ___ Bicycle, scooter, etc. ___ Water taxi ___ Non-motorized boat

6. [*FC*] Which of the following sites did you visit or do you intend to visit while at PISP today **on this trip**? [Select **ALL** that apply]

- ___ Beach 1 ___ Mill Rd Beaches ___ Lagoons Launch ___ Vista 1 ___ Rotary Pavilion
 ___ Barracks Beach ___ Beach 9 ___ Niagara Launch ___ Vista 2 ___ Cookhouse Pavilion
 ___ Beach 6 ___ Beach 10 ___ West Pier Launch ___ Vista 3 ___ Picnic Pavilions
 ___ Beach 7 ___ Beach 11 ___ East Pier ___ PI Lighthouse ___ Gull Pt Nat Area
 ___ Beach 8 ___ PISP Marina ___ North Pier ___ Sunset Point ___ Perry Monument
 ___ Tom Ridge Environmental Center ___ Multipurpose Trail

7. [*FC*] Please indicate your level of satisfaction with the following at PISP today **on this trip** on a scale from 1-7; 1= *very dissatisfied* and 7= *very satisfied*.

	Very Dissatisfied		← Neither →			Very Satisfied	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Condition of restrooms	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Restroom availability	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Condition of parking areas	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parking availability	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Traffic on park roads	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Condition of beaches	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Adequacy of park signage	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Availability of rangers and park staff	(1)	(2)	(3)	(4)	(5)	(6)	(7)

8. Please indicate the level of crowding you experienced at PISP today **on this trip** on a scale from 1-9; 1= *not at all crowded* and 9= *extremely crowded*.

Not At All Crowded	Slightly Crowded	Moderately Crowded	Extremely Crowded
(1)	(2)	(3) (4) (5) (6) (7)	(8) (9)

9. [*FC*] We would like to know more about your behaviors related to crowding. Please indicate how frequently you have ever done the following due to crowding at PISP on a scale from 1-7; 1= *never* and 7= *very frequently*.

"In response to crowding at PISP, I have..."	Never	Occasionally					Very Frequently
Recreated earlier or later in the day	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Recreated earlier or later in the year	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Recreated on weekdays to avoid weekends	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Avoided recreating on holiday weekends	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Recreated at a different location <i>within</i> PISP	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Recreated at a different location <i>outside</i> PISP	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Changed your recreation activity	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Abandoned your recreation experience altogether	(1)	(2)	(3)	(4)	(5)	(6)	(7)

10. [*FC*] Please indicate the extent to which you agree or disagree with each of the following statements at PISP on a scale from 1-7; 1= *strongly disagree* and 7= *strongly agree*.

	Strongly Disagree	Neutral					Strongly Agree
I thoroughly enjoyed my trip to PISP today	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I cannot imagine a better trip to PISP	(1)	(2)	(3)	(4)	(5)	(6)	(7)
My trip was well worth the money I spent to take it	(1)	(2)	(3)	(4)	(5)	(6)	(7)
To improve the experience, limits should be placed on the number of visitors who can use PISP at any one time	(1)	(2)	(3)	(4)	(5)	(6)	(7)
There should be no limits on the number of visitors allowed to use PISP at any one time	(1)	(2)	(3)	(4)	(5)	(6)	(7)
To improve the experience, parking availability should be used to limit the number of visitors who can use PISP	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Public shuttle transportation services onto PISP should be expanded.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PISP means a lot to me	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I enjoy recreating at PISP more than other places I could visit	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I am very attached to PISP	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I get more satisfaction out of visiting PISP than from visiting most places	(1)	(2)	(3)	(4)	(5)	(6)	(7)

-READ PROMPT & GIVE VISITOR SITE SPECIFIC FLASHCARD-

11. Please indicate how satisfied you were with your experience **at this specific site** in PISP today on a scale from 1-7; 1= *poor* and 7= *perfect*.

Poor	Fair	Good	Excellent	Perfect
(1)	(2)	(3) (4) (5)	(6)	(7)

12. Please indicate the level of crowding you experienced **at this specific site** in PISP today on a scale from 1-9; 1= *not at all crowded* and 9= *extremely crowded*.

Not At All Crowded	Slightly Crowded	Moderately Crowded	Extremely Crowded
(1)	(2)	(3) (4) (5) (6) (7)	(8) (9)

13. [*FC*] About how many other visitors did you encounter **at any one time** at **this specific** site in PISP today?

____ Visitors encountered at this site today ____ No visitor encounters at this site today ____ Don't know/Not sure

14. [*FC*] Previously, you noted how many visitors you encountered **at any one time** at **this specific** site in PISP today. Please rate the acceptability of those encounters on a scale from 1-7; 1= *very unacceptable* and 7= *very acceptable*.

Very Unacceptable	Unacceptable	Slightly Unacceptable	Neither	Slightly Acceptable	Acceptable	Very Acceptable
(1)	(2)	(3)	(4)	(5)	(6)	(7)

15. [*FC*] What is the *maximum* number of visitors you could encounter **at any one time** at **this specific site** in PISP before you would no longer recreate here? ____ Max # of visitors at any one time ____ I would visit regardless of use

16. [*FC*] How did the number of visitors you encountered **at any one time** at **this specific site** in PISP today affect the overall enjoyment of your trip today? [Select **ONE** option].

____ Added a lot to my enjoyment ____ Had no effect on my enjoyment ____ detracted a little from my enjoyment
 ____ Added a little to my enjoyment ____ Detracted a lot from my enjoyment

17. [*FC*] We would like to know more about your opinions of encountering other visitors. Please rate the acceptability of encountering a number of other visitors **at any one time** at **this specific site** in PISP today on a scale from 1-7; 1= *very unacceptable* and 7= *very acceptable*.

	Very Unacceptable	← Neither →			Very Acceptable
0-25 visitors encountered at any one time	(1)	(2)	(3)	(4)	(5) (6) (7)
26-50 visitors encountered at any one time	(1)	(2)	(3)	(4)	(5) (6) (7)
51-100 visitors encountered at any one time	(1)	(2)	(3)	(4)	(5) (6) (7)
101-200 visitors encountered at any one time	(1)	(2)	(3)	(4)	(5) (6) (7)
201+ visitors encountered at any one time	(1)	(2)	(3)	(4)	(5) (6) (7)

18. Did you have to wait to find vehicle parking at **this specific site** in PISP today? ____ Yes ____ No

a. [If YES] How long did you have to wait to find parking? ____ minutes spent waiting to park

b. [If YES] Was this wait time acceptable to you? ____ Yes ____ No

c. [If YES] How long of a wait time is so unacceptable that you would no longer visit PISP?

____ minutes spent waiting to park that is unacceptable --OR-- ____ parking wait time does not deter me

19. [*FC*] Please indicate the extent that the following issues were problems for you at **this specific site** in PISP today on a scale from 1-7; 1= *not a problem* and 7= *major problem*.

	Not a Problem	← Minor Problem →			Major Problem
Conflict from other visitors	(1)	(2)	(3)	(4)	(5) (6) (7)
Visitors not following rules	(1)	(2)	(3)	(4)	(5) (6) (7)
The actions or behaviors of other visitors	(1)	(2)	(3)	(4)	(5) (6) (7)
Crowds and crowding	(1)	(2)	(3)	(4)	(5) (6) (7)
Too many other visitors	(1)	(2)	(3)	(4)	(5) (6) (7)
Large groups of visitors	(1)	(2)	(3)	(4)	(5) (6) (7)

-READ PROMPT & GIVE VISITOR DEMOGRAPHIC FLASHCARD-

20. Is this your first trip to PISP? ____ Yes ____ No
a. *[If NO]* Including today, how many **days in the last month** (30 days) have you used PISP for outdoor recreation activities? ____ days
b. *[If NO]* Including today, how many **days in the last year** (12 months) have you used PISP for outdoor recreation activities? ____ days
c. *[If NO]* Including today, how many **total years** have you used PISP for outdoor recreation activities? ____ years
21. Is your trip today: ____ A *single* day trip to PISP → How many hours? ____ hours
--OR--
____ A *multi-day/overnight* trip to PISP → How many nights away from home? ____ nights
22. How many people are in your group today? ____ Adults ____ Children (under 18 years of age)
23. What is your home ZIP code? _____ Visitor is from another country
24. How many miles from home did you travel to this site? ____ miles *[If unsure- ask respondent to estimate]*
25. How would you describe the area in which you live? [Select **ONE** option]. ____ Urban ____ Suburban ____ Rural
26. What is your age? ____
27. [*FC*] What is your gender? (1) Male (2) Female (3) Non-binary
28. [*FC*] Which of the following best describes your political orientation? [Select **ONE** option].
Extreme Very Slightly Moderate Slightly Very Extreme
Liberal Liberal Liberal Conservative Conservative Conservative
29. [*FC*] With which racial group do you most closely identify? [Select **ONE** option].
(1) White (4) American Indian/ Alaskan Native (7) Asian
(2) Black/African American (5) Native Hawaiian/ Other Pacific Islander (8) Other
(3) Spanish/Hispanic/Latino (6) Middle Eastern/North African (9) Refused
Further detail about race: _____
30. [*FC*] In what income category does your household fall? [Select **ONE** option].
(1) Under \$25,000 (4) \$75,000-\$99,999 (7) Don't Know
(2) \$25,000-\$49,999 (5) \$100,000-\$149,999 (8) Refused to answer
(3) \$50,000-\$74,999 (6) \$150,000 or more
31. [*FC*] What is the highest level of formal schooling you have completed? [Select **ONE** option].
(1) Less than high school (3) High school graduate (5) 2 year college (7) Graduate/professional degree
(2) Some high school (4) Some college (6) 4 year college

**Thank you for taking the time to complete this survey.
This information will be used to improve the management of this resource and the overall experience.**

Appendix D. Field Observation Instrumentation

Counter: _____ Date: _____ Total Shift Time (e.g. 10am-6pm): _____

--Presque Isle State Park Carrying Capacity Study- Field Observation Sheet--

Site Name: _____ 1-hour site -OR- 2-hour site [Select ONE]

Site #1- First Count → Start Count Time: _____ End Count Time: _____

<u>Item</u>	<u>Tally Count</u>	<u>Total Count</u>
Visitors (adults & children)		
Vehicles within site boundary		
Boat trailers w/in site boundary		

Did vehicles exceed on-site/designated parking area/capacity? Yes No

⊕ **Site #1- Second Count** → Start Count Time: _____ End Count Time: _____

<u>Item</u>	<u>Tally Count</u>	<u>Total Count</u>
Visitors (adults & children)		
Vehicles within site boundary		
Boat trailers w/in site boundary		

Did vehicles exceed on-site/designated parking area/capacity? Yes No

 Site Name: _____ 1-hour site -OR- 2-hour site [Select ONE]

Site #2- First Count → Start Count Time: _____ End Count Time: _____

<u>Item</u>	<u>Tally Count</u>	<u>Total Count</u>
Visitors (adults & children)		
Vehicles within site boundary		
Boat trailers w/in site boundary		

Did vehicles exceed on-site/designated parking area/capacity? Yes No

Site #2- Second Count → Start Count Time: _____ End Count Time: _____

<u>Item</u>	<u>Tally Count</u>	<u>Total Count</u>
Visitors (adults & children)		
Vehicles within site boundary		
Boat trailers w/in site boundary		

Did vehicles exceed on-site/designated parking area/capacity? Yes No