

Beach Survey Data Report

Supplemental report for Healthy Waterways: A Health Impact Assessment of the City of Rochester, New York's Local Waterfront Revitalization Program

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Executive Summary

This report summarizes data collected from beach user surveys conducted at Durand and Ontario Beaches on Lake Ontario during July and August 2012 as part of Healthy Waterways, a Health Impact Assessment (HIA) of the City of Rochester, New York's Local Waterfront Revitalization Program (LWRP). We conducted this assessment in parallel with the city's LWRP planning process to clarify health impacts of potential changes along Rochester's waterfront. The information summarized in this survey report contributed to the development of recommendations to help decision makers maximize health benefits and minimize risks to health. This report was drafted in September 2012 and updated based on stakeholder feedback and additional data collection in June 2013.

The HIA was conducted by the University of Rochester's Environmental Health Sciences Center with funding from the Health Impact Project, a collaboration of the Robert Wood Johnson Foundation and The Pew Charitable Trusts. The opinions expressed are those of the authors and do not necessarily reflect the views of the Health Impact Project, Robert Wood Johnson Foundation or The Pew Charitable Trusts.

The City of Rochester has many waterfront assets that have the potential to influence health outcomes, including its beaches on Lake Ontario (Durand Eastman Park and Ontario Beach Park). Because the LWRP is likely to affect these resources, the study team was interested in knowing how the resources are currently used, how current use impacts health, and how those factors are likely to change based on LWRP recommendations. This report presents initial results from a survey designed to collect information about these issues from current beach users.

The 10-minute, voluntary survey was based on guidance from City of Rochester and Monroe County beach staff, and on beach and water quality surveys conducted in other communities. The survey was reviewed by the URM Research Subjects Review Board prior to implementation. Surveys were conducted at the beaches only during times that lifeguards were on duty, whether or not the water was open for swimming. A total of 202 surveys were taken during the 90-plus person-hours spent surveying.

Just over half (59%, 119) of the beach user surveys were collected at Ontario Beach, while 41% (83) were from Durand. The majority of respondents were white (89%), female (66%), and non-Hispanic (88%); 72% (109) of respondents reported an annual income of over \$35,000. Of those who used the beach in the previous season, 47% (67) visited five or more times, indicating that a significant number of people are regular beach users. The vast majority of visitors use the beach in the summer; only 7% indicated they use it "all year."

The study team was interested in finding out whether beach users are aware that they can check for water closures before arriving, and whether this influences their trip to the beach or choice to swim. Almost half of respondents at both beaches check for beach closings (Ontario: 45% and Durand: 49%). The study team also asked about certain water quality issues, and whether beach users felt they had been affected by them. While water quality seems to be affecting users at both beaches, users at Ontario were more likely to report being affected. In particular, odor near waterways affects more users at Ontario Beach (67%) than those at Durand (44%). Survey staff noted that several respondents did not know what zebra mussels were, and some may have confused "algae" and "weeds" which were asked about separately.

There are key differences between changes that are likely to influence future beach use at Ontario and Durand. Some possible changes – such as better maintenance, improved water quality, and better

facilities - were desired by respondents from both beaches. Ontario Beach respondents indicated more strongly that improved water quality would increase their beach use. Beach users at Durand were more likely to report that no changes would cause them to visit more often. Respondents at both beaches felt very strongly that worsened water quality and higher parking fees would decrease their beach usage. In interpreting these results, it is important to remember that these findings are limited by the small sample size, as well as by the sampling frame. Few surveys were collected during evening and weekend hours due to limited time and resources for surveying, and none were taken when the beaches were closed (outside of guarded hours). In addition, it is important to remember that these responses come from current beach users, not those who might use the beach if conditions were different.

In addition to the beach user survey, a survey with similar questions was conducted in Fall 2013 with 123 respondents at the Rochester Public Market ("public market survey"). This survey allowed us to explore potential barriers to beach use by people who were not actively using the beach. Due to small sample sizes, the results of this survey are primarily presented as supporting data as a pilot for future survey efforts.

This report provides additional background information and summary of data not presented in the full Healthy Waterways report, which is available online at <http://www2.envmed.rochester.edu/envmed/EHSC/outreach/coec/projects/HIA/HealthyWaterways.html>.

Introduction

The City of Rochester is updating its Local Waterfront Revitalization Program (LWRP). The LWRP, conducted as part of the New York State Division of Coastal Resources (NYSDCR) statewide coastal management program, will guide city, private, and state/federal decisions affecting Rochester's waterways into the next decade.¹ Plans and projects recommended in the LWRP may result in changes to social determinants of health, including physical activity opportunities, water quality, access to health-supportive resources, and safety. The University of Rochester Environmental Health Sciences Center is conducting a Health Impact Assessment (HIA) of the LWRP. HIA is a voluntary process for analyzing the potential health impacts of non-health policies. The HIA of the LWRP is being funded by the Health Impact Project, Robert Wood Johnson Foundation or The Pew Charitable Trusts. The HIA aims to identify and address the positive and negative potential human health impacts of the LWRP, and make recommendations to the City to maximize identified benefits and minimize potential negative impacts.

The City of Rochester has many waterfront assets that have the potential to influence health outcomes, including the Genesee Riverway Trail system and two beaches on Lake Ontario (Durand Eastman Park and Ontario Beach Park). Because the LWRP is likely to affect these resources, the study team is interested in knowing how the resources are currently used, how current use impacts health, and how those factors are likely to change based on LWRP recommendations. This report focuses on the health impacts of beach use at Ontario Beach and Durand Eastman Park.

Beaches are associated with a variety of health outcomes, both positive and negative. While beaches can provide a variety of opportunities for physical activity, issues of water quality and physical safety may pose health risks. For example, exposure to water with high levels of bacteria can lead to illness. Likewise, beach use may also increase the potential for physical injury and drowning.

While researching background information for the HIA, we determined that there was not enough existing information to assess health impacts of Rochester's beaches. Therefore, we conducted a survey to find out more about how, how often, and by whom these beaches are currently used, as well as ways their use could be impacted by potential changes to the beach or water quality (Appendix 1).

While it is helpful to know who visits Rochester's beaches, it is also important to understand who does not visit the beaches and why. In fall 2012, an MPH student adapted our beach and trail user surveys to conduct a general community survey at the Rochester Public Market. This white paper summarizes survey results collected in July 2012 at Ontario and Durand beaches and beach-related results of the public market survey.²

¹ <http://www.dos.ny.gov/communitieswaterfronts/WFRevitalization/LWRP.html>

² Additional public market survey results are summarized in Jacob Taylor's master's thesis, "Self-Reported Facilitators and Barriers to Trail Use Along an Urban Community Trail," posted online at <http://www2.envmed.rochester.edu/envmed/EHSC/outreach/coec/projects/HIA/HealthyWaterways.html>

Methods

Based on guidance from City of Rochester and Monroe County beach staff, and beach and water quality surveys conducted in other communities, project staff developed, piloted, and revised the survey protocol. The survey was reviewed by the URM Research Subjects Review Board prior to implementation. Survey questions were developed to capture demographic data from beach users, as well as information about how they use the beach, their preferences, and reactions to potential future changes to the beach. Several questions regarding water quality from the Water Education Collaborative (WEC) 2009 Community Survey were also included.

Surveys were conducted by a team of two to four people at Durand Eastman Beach and Ontario Beach, both located within the LWRP boundary. The beaches were separated into two conditions each. Because visitors are unable to access the water when Ontario Beach is closed for swimming, beach surveys were coded based on open and closed (due to poor water quality) conditions. Durand Beach, however, is more complicated. Durand has a guarded area that spans only a portion of the sand beach. Although swimming is prohibited in the unguarded sections of Durand Beach, people nonetheless use the water outside this guarded area. Many users ignore posted signs and encouragement by lifeguards to swim in the guarded section. The study team therefore divided Durand into guarded (when the guarded swim beach was open) and unguarded (unguarded beach regardless of whether the guarded beach was closed due poor water quality) sections. This was done in order to understand whether water quality warnings/beach closings and the presence of lifeguards influenced people's decision to use the water. The survey team recorded beach condition on the surveys along with the time the survey was conducted, the name of the surveyor, and the weather conditions at the beach. The beach conditions were coded as follows:

1. Ontario (open, during guarded hours)
2. Ontario (closed)
3. Durand (Area A, during guarded hours)
4. Durand (unguarded areas B, C and D)

The project team surveyed beachgoers on the sand beach during the hours of operation (11 am to 7pm). In general, at least one adult from each group of beach users on the beach at that time was invited to take the survey; participants had to be 18 years or older. The survey typically took 5 to 10 minutes to complete. Most surveys were collected on weekday afternoons from around 11:30 am to 3 pm in fair weather. For safety reasons, no staff member was ever alone on the beach or out of sight of another staff member.

Public market survey data was collected on Saturdays at the Rochester Public Market during October and November 2012 ("public market survey"). The survey typically took 10 to 15 minutes to complete.

Project staff spent approximately 21 hours surveying at the beach, plus an additional 10 hours for commuting and setup time. Since the study team usually had 3 surveyors, this equated to a total of over 90 person-hours spent surveying. In addition, data entry took about 10 hours; preliminary analysis and reporting (in table form) took an additional 15 hours (not including report writing). Data collection and analysis for the public market survey took approximately 26 person-hours to complete. This information may be useful to future efforts to replicate or expand on this survey effort. Data collected through 202 beach surveys and 123 public market surveys were entered and summarized using Microsoft Excel. This white paper reports on the data analysis. All data was double entered to ensure accuracy.

Results

Beach survey results were divided into three sections: demographics, beach user behaviors, and future changes. The demographic section included information such as beach location and condition, and respondents' gender, race, ethnicity and income. Beach user behavior included with whom users were visiting the beach, how often they visited the beach, and what activities they were engaged in. Lastly, the future changes section included data obtained from a series of questions that explored whether respondents would use the beach more or less in the future if various changes were made.

Public market survey results are summarized where available.

It is important to note that the sample size for both surveys was small, and that most survey trips to the beach fell on weekday afternoons. Due to time constraints and weather, the survey team was unable to survey as much at other times of day or on weekends, during which the characteristics of beach and public market visitors may have been different.

Demographics

Table 1: Summary

Condition	All Responses		Hours Spent Surveying
	#	%	
<i>Ontario Open</i>	60	30%	4 hr 27 min
<i>Ontario Closed</i>	59	29%	5 hr 47 min
Ontario Total	119	59%	10 hr 14 min
<i>Durand Guarded</i>	36	18%	3hr 10 min
<i>Durand Not Guarded</i>	47	23%	3 hr 49 min
Durand Total	83	41%	7 hr
Overall Total	202	100%	34 hr 17 min

Table 2: Summary Responses by Gender

Condition	Male		Female	
	#	%	#	%
Ontario Open (N=51)	15	29%	36	71%
Ontario Closed (N=51)	15	29%	36	71%
Ontario Total (N=102)	30	29%	72	71%
Durand Guarded (N=30)	12	40%	18	60%
Durand Not Guarded (N=42)	17	40%	25	60%
Durand Total (N=72)	29	40%	43	60%
Overall Total (N=174)	59	34%	115	66%

A little over half (59%, 119) of the beach user surveys were collected at Ontario Beach, while 41% (83) were from Durand (Table 1). Project staff collected about the same number of surveys at Ontario open and Ontario closed, with 30% (60) of all surveys collected from Ontario open and 29% (59) from Ontario closed. There was slightly more variation by condition at Durand beach. Of all surveys collected this

summer, 23% (47) were collected on the unguarded beach at Durand, while 18% (36) were from the guarded beach. These results match observations by project staff that, even on days when Durand was open for swimming, more people congregated on the unguarded sections of beach. Survey staff observed that many people on the unguarded section of beach were using the water. Because there were usually more people on the unguarded section of beach, we were able to obtain more surveys from this condition.

There does not appear to be a gender response difference during open/closed or guarded/not guarded conditions at both beaches. Overall, more females participated than males, and the survey team reported observing more females on the beach than males (Table 2). As with other demographic trends, it is unknown whether time of day or day of the week played a role in gender ratios. In addition, surveyors noted that females seemed more willing to agree to take the survey when invited.

Table 3: Demographics

Demographic	Total		Ontario Beach		Durand Beach		City of Rochester*	Monroe County*
	#	%	#	%	#	%	%	%
Race	N=189		N=111		N=78		N=211,457	N=742,783
White	169	89%	104	94%	65	83%	46%	77%
Black	13	7%	5	5%	8	10%	41%	15%
Other	7	4%	2	2%	5	7%	13%	9%
Ethnicity	N=104		N=58		N=46		N=211,457	N=742,783
Non-Hispanic	92	88%	50	86%	42	91%	84%	93%
Hispanic/Latino	12	12%	8	14%	4	9%	16%	7%
Household Income	N=151		N=99		N=52		N=86,009	N=293,104
Less than \$10,000	11	7%	5	5%	6	12%	18%	8%
\$10,000 - \$14,999	5	3%	3	3%	2	4%	8%	5%
\$15,000 - \$24,999	12	8%	8	8%	4	8%	16%	11%
\$25,000 - \$34,999	14	9%	12	12%	2	4%	14%	11%
\$35,000 - \$74,999**	67	44%	46	46%	21	40%	29%	32%
\$75,000 or more	42	28%	25	25%	17	33%	15%	33%

*Monroe County and City of Rochester demographic data are from the 2011 American Community Survey 5-year Estimate, U.S. Census Bureau, Table DP05 Demographic and Housing Estimates, and DP03 Selected Economic Characteristics

**The categories \$35,000 - \$39,000 and \$40,000 - \$74,999 were combined to \$35,000 - \$74,999 for comparison to census data.

Table 3 summarizes the demographic profile of beach survey respondents. Most people surveyed at both Ontario and Durand were non-Hispanic 88% (92), and most 89% (169) were White. However, surveyed users at Durand Beach were more racially diverse than those surveyed at Ontario Beach, with 17% (13) of

respondents identifying as Black or Other at Durand versus only 6% (7) respondents identifying as Black or Other at Ontario. In this summary, "Other" includes those who reported their race as Asian, those who checked more than one race, and those who listed a race other than the ones listed. The Hispanic versus non-Hispanic breakdown was very similar between beaches, with 86% (50) of those who answered identifying as non-Hispanic at Ontario and 91% (42) at Durand.

Household income was also similar between beaches, with more than half of respondents reporting an income of \$35,000 or more (Table 3). According to the 2011 American Community Survey 5-year estimate, the median household income for the City of Rochester is \$30,367, and 28% of Rochester families live in poverty (Table 3). The results highlighted in Table 3 indicate that the income profile of respondents is more similar to the Rochester, NY metro area than to Rochester City data, which may suggest that beach goers come from all over the Greater Rochester area or that higher-income City residents are more likely to use the beach. Plans for future analysis include mapping respondent addresses to develop a geographic profile of beach users.

The surveying team did not observe a difference in race nor ethnicity between those who chose to take our survey and those who did not, with the exception of a handful of people who refused to take the survey because of a language barrier.

Table 4 summarizes the demographics of public market survey respondents. Respondents were more racially, ethnically, and economically similar to Monroe County residents than to those living within the City of Rochester. A vast majority of respondents had attended some college or attained a college degree (94%, 108). The time of year surveys were collected (October-November) and low number of survey responses should be considered when interpreting results of this pilot survey.

Table 4: Public market survey respondent demographics

	Total (N=123)*		City of Rochester** (N=211,457)	Monroe County** (N=742,783)
	N	%	%	%
Gender				
Female	50	46%	52%	52%
Male	58	54%	48%	48%
Age				
18-29	26	23%	--	--
30-44	21	18%	--	--
45-54	35	31%	--	--
55+	32	28%	--	--
Race				
White	87	76%	46%	77%
Black	16	14%	41%	15%
Other	12	10%	13%	9%
Ethnicity				
Non-Hispanic	88	95%	84%	93%
Hispanic or Latino	5	5%	16%	7%
Income				
<\$10,000	5	4%	18%	8%
\$10,000-\$14,999	3	3%	8%	5%
\$15,000-\$24,999	9	8%	16%	11%
\$25,000-\$34,999	12	11%	14%	11%
\$35,000-\$74,999	45	39%	29%	32%
>\$75,000	40	35%	15%	33%
Education				
Some or No High School	0	0%	22%	12%
High School Graduate	3	3%	27%	25%
Vocational/Technical	3	3%	--	--
Some College	22	19%	18%	17%
College Graduate or higher	86	75%	33%	46%

*Monroe County and City of Rochester demographic data are from the 2011 American Community Survey 5-year Estimate, U.S. Census Bureau, Table DP05 Demographic and Housing Estimates, and DP03 Selected Economic Characteristics

Beach User Behaviors

Most people were visiting the beaches with friends and/or family (31%, 61 and 57%, 114, respectively) (Table 5). Almost a third (28%, 55) of respondents at both beaches reported being with children under the age of 16. The team also noticed large groups of children under 16 at Ontario beach visiting as part of day camps. Overall, there did not seem to be a difference in group composition between the beaches, with the exception that twice as many people reported being by themselves at Ontario than at Durand (12%, 14 and 6%, 5 people, respectively). Most survey times fell on weekday afternoons, during times in which lifeguards noted they saw the largest percentage of parents and grandparents with small children at the beach. The composition of groups may be different at other times of day.

Table 5: "Who are you here with?"*

Beach	Friends		Family		Children (under 16)		By Myself		Dog		Club or Organization	
	#	%	#	%	#	%	#	%	#	%	#	%
Ontario (N=118)	34	29%	64	54%	32	27%	14	12%	1	1%	5	4%
Durand (N=82)	27	33%	50	61%	23	28%	5	6%	0	0%	2	2%
TOTAL (N=200)	61	31%	114	57%	55	28%	19	10%	1	1%	7	4%

*Multiple answers allowed

Table 6: Activity*

	Ontario Open (N=60)		Ontario Closed (N=59)		Ontario Total (N=119)		Durand Guarded (N=36)		Durand Not Guarded (N=47)		Durand Total (N=83)		TOTAL (N=202)	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Swimming	34	57%	4	7%	38	32%	22	61%	25	53%	47	57%	85	42%
Picnicking	5	8%	5	8%	10	8%	2	6%	11	23%	13	16%	23	11%
Walking	12	20%	8	14%	20	17%	4	11%	16	34%	20	24%	40	20%
Sunbathing	44	73%	47	80%	91	76%	21	58%	18	38%	39	47%	130	64%
Sports	2	3%	1	2%	3	3%	0	0%	0	0%	0	0%	3	1%
Other	6	10%	15	25%	21	18%	2	6%	5	11%	7	8%	28	14%

*Multiple answers allowed

Table 7: Number of Times Beach Survey Participants Visited the Beach Last Summer

Number of Times Visited	Ontario Open (N=60)		Ontario Closed (N=57)		Ontario Total (N=117)		Durand Guarded (N=36)		Durand Not Guarded (N=47)		Durand Total (N=83)		TOTAL (N=200)	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
0	16	27%	13	23%	29	25%	13	36%	16	34%	29	35%	58	29%
1-4	30	50%	18	32%	48	41%	9	25%	18	38%	27	33%	75	38%
5-10	4	7%	14	25%	18	15%	9	25%	5	11%	14	17%	32	16%
11-20	7	12%	6	11%	13	11%	2	6%	2	4%	4	5%	17	9%
21+	3	5%	6	11%	9	8%	3	8%	6	13%	9	11%	18	9%

Table 8: Number of Times Public Market Survey Participants Visited the Beach During Summer 2012

	Ontario Beach (N=120)		Durand Beach (N=123)	
	N	%	N	%
Never	42	35%	63	51%
1-4	50	42%	40	33%
5-10	20	17%	9	7%
11-20	6	5%	7	6%
21 or more	2	2%	4	3%

Table 9: Seasons During Which Participants Use the Beach*

Seasons Used	Ontario Open (N=55)**		Ontario Closed (N=57)**		Ontario Total (N=112)**		Durand Guarded (N=35)**		Durand Not Guarded (N=47)**		Durand Total (N=82)**		TOTAL (N=194)**	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
All Year	3	5%	2	4%	5	4%	2	6%	6	13%	8	10%	13	7%
Summer	52	95%	55	96%	107	96%	33	94%	41	87%	74	90%	181	93%
Fall	14	25%	10	18%	24	21%	10	29%	8	17%	18	22%	42	22%
Winter	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Spring	14	25%	16	28%	30	27%	11	31%	7	15%	18	22%	48	25%

*Multiple answers allowed; participants who checked all four seasons were coded as "All Year" only

**Excludes "Don't Know" responses

Table 10: Total Length of Time Respondents Plan to Spend at the Beach

	Ontario Open	Ontario Closed	Ontario Total	Durand Guarded	Durand Not Guarded	Durand Total	TOTAL
Time Spent at Beach (hr)	Mean:	Mean:	Mean:	Mean:	Mean:	Mean:	Mean:
	3.22	3.34	3.28	4.17	3.10	3.57	3.40
	Median:	Median:	Median:	Median:	Median:	Median:	Median:
	3.00	3.00	3.00	3.50	2.75	3.00	3.00

To address physical activity and overall beach use, the beach user survey included questions regarding the types of activities participants engaged in at the beach, and the overall amount of time spent there. We were also interested in understanding how many people swim at the beaches, particularly when the water is closed.

Ontario and Durand Beaches are different in that the entire stretch of sand at Ontario is lifeguarded, whereas only a small portion of the sand beach at Durand is guarded for swimming. Therefore, when Ontario is closed for swimming due to poor water quality, beach goers are unable to access the water (lifeguards remain on duty to make sure no one swims). Although signs are posted at Durand and lifeguards do their best to encourage swimmers to use the guarded beach only, swimmers can and do access the water when it is closed for swimming by going to unguarded sections.

There does not appear to be a difference between the number of people who swim at Ontario when it is open for swimming (57%, 34) and at Durand overall (57%, 47) (Table 6). The study team was unable to survey at Durand Beach while the water was closed for swimming, but have heard anecdotal reports

from beach users and beach staff that people sometimes swim at Durand Beach when it is closed due to water quality.

In general, a smaller percentage of respondents reported swimming or walking at Ontario (32%, 38 and 17%, 20, respectively) than at Durand (57%, 47 and 24%, 20, respectively), especially when the water was closed (Table 6). The most common form of active recreation at both beaches was swimming; very few people reported playing sports (none at Durand). About 20% (40) of people reported walking at both beaches. Both beaches also appear to be important resources for relaxation and social cohesion, with over half of respondents reporting that they engaged in sunbathing or other passive activities.

We asked people how often they used the beaches last summer as a proxy for overall beach use. Although estimates of past use may be affected by recall bias (not remembering accurately), variations in weather from year to year, or that the respondents recently moved to the area or were just visiting, the study team determined that estimates of past use were likely to be more accurate than projections of future use. Table 7 summarizes responses about frequency of use over the past summer. Excluding those who reported that they did not use the beach at all in 2011, nearly half (47%, 67) of respondents used the beach regularly (five or more times), with 25% (35) reporting that they visited the beach 11-21+ times last summer. As expected, most people reported using the beach in the summer (93%, 181) with some using it in the spring (25%, 48) and fall (22%, 42); very few respondents used the beach year round (7%, 13) (Table 9). Most people reported using the beach for about 3 hours. The length of time spent at the beach was not clearly related to whether the water was open for swimming or not (Table 10).

About two thirds (65%, 78) of public market survey participants had visited Ontario Beach in 2012 (Table 8). About half (49%, 60) had visited Durand. Of those who did visit, most only went 1-4 times (42%, 50 for Ontario Beach and 33%, 40 for Durand).

Visitors who had not visited Durand and/or Ontario beaches in 2012 were asked why not. The vast majority of responses related to personal reasons preventing beach use (e.g., not enough time). Other factors included water quality, cleanliness, and safety. Of those who did not visit Durand, 20% (10) did not visit because of water quality or cleanliness concerns; 4% (2) answered with concerns about safety. For Ontario beach, 29% (8) responded with water quality and cleanliness concerns; 7% (2) were concerned about safety. However, when asked whether they would consider visiting Rochester's beaches more often, 75% (15) of respondents commented about poor water quality preventing them from visiting more. Twenty percent (4) responded with concerns about safety. Nearly a quarter of respondents provided general comments related to water quality and safety concerns (24%, 4 for both safety and water quality comments).

Table 11: Transportation Methods Used to Access the Beach*

Transportation Method	Ontario Beach (N=119)		Durand Beach (N=83)		Total (N=202)	
Drove	108	91%	81	98%	189	94%
Walked	5	4%	1	1%	6	3%
Biked	4	3%	1	1%	5	2%
Took the Bus	3	3%	1	1%	4	2%
Boat	0	0%	0	0%	0	0%
Other	1	1%	0	0%	1	0%
Distance Traveled (miles)	Mean: 16.72 Median: 11.00		Mean: 20.08 Median: 9.00		Mean: 18.07 Median: 10.00	

*Multiple answers allowed

Table 11 summarizes transportation methods and distance traveled to access the beach. The vast majority of survey respondents reported driving to the beach – 98% (81) of respondents at Durand and 91% (108) at Ontario. Others walked (3%, 6), biked (2%, 5) or took the bus (2%, 4). No respondents reported accessing the beach by boat. However, staff at Durand reported that people often swim to the beach from boats, a practice that was observed by staff. On average, respondents traveled about 18 miles to access the beach. Ontario users traveled about 16.72 miles compared to Durand users who traveled about 20.08 miles to access the beach. The median distance traveled ranged from 9 to 11 miles.

Table 12: Water Quality Issues Affecting Beach Survey Respondents and Monroe County residents - Responses to the question, "In the past year, have you been personally affected by...?"*

	Ontario Beach		Durand Beach		Total		Monroe County Survey Responses
	# Yes	% Yes	# Yes	% Yes	# Yes	% Yes	%
Beach closings	N=116 52	45%	N=82 26	32%	N=198 78	39%	27%
Odor near waterways	N=114 76	67%	N=82 36	44%	N=196 112	57%	31%
Zebra Mussels	N=113 11	10%	N=81 9	11%	N=194 20	10%	14%
Taste in drinking water	N=113 15	13%	N=82 9	11%	N=195 24	12%	22%
Too much algae in water	N=115 68	59%	N=82 34	41%	N=197 102	52%	22%
Too many weeds in water	N=114 42	37%	N=82 19	23%	N=196 61	31%	19%
Getting sick after swimming	N=115 7	6%	N=81 5	6%	N=196 12	6%	--
Fish consumption advisories	N=115 9	8%	N=81 10	12%	N=196 19	10%	21%

*The Ad Council of Rochester, Sigma Marketing Group, and the Water Education Collaborative (WEC). 2009. "2009 Community Survey." This survey included 200 Monroe County residents and 200 residents from surrounding counties. Only responses from Monroe County residents are reported here.

*Table 13: Water Quality Issues Affecting Public Market Survey Respondents and Monroe County residents: Responses to the question, “In the past year, have you been personally affected by...”**

	Public Market Survey Responses		Monroe County Survey Responses
	# Yes	% Yes	%
Beach closings (N=118)	32	27%	27%
Odor near waterways (N=119)	55	46%	31%
Too much algae in water (N=118)	50	42%	22%
Getting sick after swimming (N=116)	7	6%	--

*The Ad Council of Rochester, Sigma Marketing Group, and the Water Education Collaborative (WEC). 2009. “2009 Community Survey.” This survey included 200 Monroe County residents and 200 residents from surrounding counties. Only responses from Monroe County residents are reported here.

While water quality seems to be impacting users at both beaches, users at Ontario were more likely to report being affected (Table 12). In particular, odor near waterways affects more users at Ontario Beach (67%, 76) than those at Durand (44%, 36). Issues that seemed to most often personally affect beachgoers in this past year at both beaches were odor near waterways (57%, 112), too much algae in the water (52%, 102) and beach closings (39%, 78). Beachgoers at Ontario also reported being personally affected by beach closings, too much algae in the water, and too many weeds in the water more often than Durand Beach users.

Public market survey respondents were only asked about beach closings, odor, algae and getting sick after swimming (Table 13). Fewer public market survey respondents were affected by beach closings, odor and algae than beach survey respondents; both beaches had similar responses regarding water-related illness. Forty-six percent (55) of public market survey respondents reported that they were affected by odor; 42% (50) were affected by too much algae. Fewer reported being affected by beach closings (27%, 32), likely because many respondents had not visited the beach in 2012.

We compared results from beach user and public market surveys to results from a randomized survey of 200 Monroe County residents in order to identify possible differences in water quality perception and experiences. The survey was administered in 2009 by Sigma Marketing Group for the Water Education Collaborative. Respondents at both beaches reported being personally affected by water contact and beach use issues more than the random sample of Monroe County residents (Table 12). However, with respect to broader, long-term water quality issues such as the presence of zebra mussels, the taste of drinking water, and fish consumption advisories, Monroe County residents seem to feel more affected. Survey staff noted that several respondents did not know what zebra mussels were, and some may have equated “algae” and “weeds.”

Public market survey respondents also reported that they were more affected by odors and algae than Monroe County respondents (Table 13). There was no difference in the impact of beach closings on market respondents than on Monroe County respondents.

Future Changes

Table 14: Beach User Survey Responses Regarding Changes that May Impact Frequency of Beach Use (“I would visit the Beach More If...”)

Reason	Ontario Beach							Durand Beach						
	Disagree		Neutral		Agree		Rating*	Disagree		Neutral		Agree		Rating*
Better-Maintained	N=117 8	7%	37	32%	72	62%	3.88	N=80 9	11%	33	41%	38	48%	3.60
Safer	N=113 12	11%	51	45%	50	44%	3.50	N=78 16	21%	27	35%	35	45%	3.38
Open More Often	N=114 11	10%	52	46%	51	45%	3.51	N=79 13	16%	31	39%	35	44%	3.43
Better Facilities	N=114 11	10%	37	32%	66	58%	3.75	N=79 8	10%	14	18%	57	72%	4.00
Better Water Quality	N=117 3	3%	8	7%	106	91%	4.64	N=77 6	8%	21	27%	50	65%	3.94
More shops, vendors	N=115 11	10%	33	29%	71	62%	3.83	N=79 24	30%	16	20%	39	49%	3.25
Nothing	N=108 43	40%	46	43%	19	18%	2.65	N=73 19	26%	23	32%	31	42%	3.21
Spray Park or pool	N=110 19	17%	34	31%	57	52%	3.65	N=78 30	38%	22	28%	26	33%	2.87

* Calculated by averaging Likert responses ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The number shown represents how strongly each factor is likely to influence beach use. If the number is below 3, most respondents disagreed; if it is above 3 most people agreed. Averages farther above or below 3 indicate a stronger response.

The beach survey examined whether certain possible future changes at the beaches could impact the frequency of beach use. As summarized in Table 14, there are some key differences between changes that are likely to influence beach use at Ontario and Durand. On a scale from 1 (strongly disagree) to 5 (strongly agree), respondents were asked whether certain changes to the beach would increase their use of the beach. We averaged participant responses to calculate and overall rating for each suggested possible change, indicating the strength of desirability for each possible change listed. Some possible changes – such as better maintenance, improved water quality, and better facilities - were desirable for all beach users in general, with similar ratings at both beaches. Ontario Beach respondents were more strongly influenced by water quality than Durand users (4.64 versus 3.94, respectively).

One possible future change did seem very different between the beaches, however. With the exception of better facilities, Durand users seemed to prefer less development when compared to Ontario users. For instance, respondents at Ontario seem to favor a spray park or pool (3.65), while Durand beach goers

do not believe that would lead them to use the park more (2.87). Similarly, when asked whether more shops, vendors and restaurants would lead them to use the beach more, Ontario users responded more positively (3.83) than those at Durand (3.25).

Table 15: Beach User Survey Responses Regarding Changes that May Impact Frequency of Beach Use (“I would visit the Beach Less If...”)

Reason	Ontario Beach							Durand Beach						
	Disagree		Neutral		Agree		Rating	Disagree		Neutral		Agree		Rating
Worse Water Quality	N=118 11	9%	10	8%	97	82%	4.34	N=79 5	6%	7	9%	67	85%	4.35
Higher Parking Fees	N=117 9	8%	9	8%	99	85%	4.38	N=77 5	6%	7	9%	65	84%	4.47
Fewer Lifeguarded Times	N=113 18	16%	46	41%	49	43%	3.43	N=76 20	26%	26	34%	30	39%	3.24

The beach survey also asked users about possible changes to the beaches that might cause them to visit the beach less. Respondents at both beaches felt very strongly that worsened water quality and higher parking fees would decrease their beach usage (Table 15). Unsurprisingly, most respondents at both beaches (82%, 97 respondents at Ontario and 85%, 67 respondents at Durand) agreed that worse water quality would cause them to visit the beach less. It was the same for higher parking fees - respondents at both beaches (85%, 99 respondents at Ontario and 84%, 65 respondents at Durand) agreed that any or higher parking fees would cause them to visit the beach less. Although about 40% of people at both beaches (49 at Ontario and 30 at Durand) said that fewer lifeguarded times would cause them to visit the beach less, the average rating at each beach for fewer lifeguarded times was very close to neutral (3.43 and 3.24, respectively), suggesting beach use would not be strongly influenced by this change.

<i>Table 16: Public Market Survey Responses Regarding Changes that May Impact Frequency of Beach Use (“I would visit the Beach More If...”)</i>	Disagree		Neutral		Agree		Rating*
Better-maintained (N=117)	13	11%	31	26%	73	62%	3.78
Safer (N=119)	16	13%	47	39%	56	47%	3.51
Open more often (N=118)	23	19%	56	47%	39	33%	3.18
Better facilities (N=116)	11	9%	53	46%	52	45%	3.55
Better water quality (N=119)	7	6%	19	16%	93	78%	4.27
More shops, vendors (N=118)	16	14%	34	29%	68	58%	3.69
Spray park or pool (N=117)	36	31%	41	35%	40	34%	3.09
Better bus service (N=118)	46	39%	51	43%	21	18%	2.68
I lived closer to it (N=119)	33	28%	31	26%	55	46%	3.26
I knew more about it (N=118)	31	26%	46	39%	41	35%	3.08

Public market survey responses about factors that would lead to increased beach use were similar to beach user survey responses (Table 16). In particular, better water quality (78%, 93), improved maintenance (62%, 73), and more shops/vendors (58%, 68) were the most commonly selected changes that would encourage people to use the beach more. The ratings for these changes were 4.27, 3.78, and 3.69, respectively, suggesting that poor water quality is a barrier for potential visitors.

Table 17: Beach Closings*

	Ontario Beach		Durand Beach		Total	
Check for Closings	N=114 51	45%	N=81 40	49%	N=195 91	47%
Where do you check?	N=55		N=40		N=95	
Signs at the beach	12	22%	10	25%	22	23%
Radio/TV	14	25%	10	25%	24	25%
Newspaper	5	9%	3	8%	8	8%
Phone	26	47%	22	55%	48	51%
Other	16	29%	7	18%	23	24%
Why don't you check?	N=64		N=41		N=105	
I don't get wet	19	30%	5	12%	24	23%
Water is safe enough	13	20%	14	34%	27	26%
Don't know how	15	23%	12	29%	27	26%
Other	20	31%	13	32%	33	31%

* Some respondents answered both "Why don't you check?" and "Where do you check?"

The study team was interested in finding out whether beach users were aware that they can check for water closures before arriving, and whether this influences their trip to the beach or choice to swim (Table 17). Almost half of respondents at both beaches said they check for beach closings (45%, 51 of Ontario users and 49%, 40 of Durand beach users). For those who did report that they check the closings, most (51%, 48) used the phone to get their information. Monroe County operates a telephone hotline that updates daily with beach closure information. About one quarter of respondents selected "other," many of whom indicated that they check the internet for closure information.

There appear to be some differences for why users do not check for beach closures. At Ontario Beach, the most common answers were "I don't get wet" (30%, 19) and "Other" (31%, 20). Users at Durand, however, were more likely to respond that the "Water is safe enough" (34%, 14) or "other" reasons (32%, 13) such as "[I] don't care", "[I] don't think to," and "[I'm] from out of town."

Discussion

One of the goals of the beach user survey was to obtain initial information about the current and potential health impacts of beach use. In particular, we were interested in how changes that might influence physical activity opportunities (such as swimming and walking), water quality, and physical safety. While swimming, walking, sports and relaxation can have significant health benefits for beach users, it is unclear whether the beach is currently a source of these health-benefitting activities for a large number of beach users. Likewise, water-based recreation can pose health risks such as exposure to waterborne pathogens, excess sun exposure, and physical injuries or drowning.

The results of this survey suggest that beach users are particularly aware of water quality issues in Lake Ontario, and that water quality greatly influences beach use. However, anecdotal reports and observations by staff suggest that many users do not have a complete understanding of the health risks posed by poor water quality, with users both over- and under-estimating the posed risks in different situations. Project staff noted that there is limited (no) information at either beach to explain to visitors why the beaches close, how to minimize risks through behavioral choices, or to explain water quality and risks in general. Educational efforts at both beaches may help promote beach use while also helping to protect current users. Educational and outreach messages throughout the city, in conjunction with water quality improvement efforts, may encourage others to visit the beaches. Water quality perceptions reported by public market survey respondents support this approach.

Increasing Beach Visitation and Physical Activity

Excluding beach survey responses from Ontario when it was closed due to poor water quality, more than half of respondents reported swimming as part of their activities at both beaches. This suggests that the water is a physical activity resource for many users. When Ontario Beach was closed for swimming, fewer than a third of respondents reported engaging in active recreational activities. According to beach management and staff, Lake Ontario provides an opportunity for beach visitors to cool off on hot days. While there are many other opportunities for physical activity at this beach – including pickleball, volleyball and basketball - visitors who plan to swim but find the water closed may not engage in these alternate activities because they do not reduce heat exposure. The survey team noted that on days when Ontario Beach was closed for swimming, visitors with young children used nearby water spigots to play and cool off, suggesting that a spray park might be an addition that increases visitation and/or physical activity, particularly when the beach is closed. This observation is supported by responses by beach survey participants, who largely answered in favor of a spray park or pool at Ontario Beach. Public market survey responses were less convincing that a spray park or pool would draw new visitors (average rank 3.09). Improving water quality and beach users' perceptions of water quality (discussed below) may also increase physical activity at the beaches.

Survey participants at Durand Beach differed from Ontario users in that they felt strongly that new facilities such as a spray park or shops and vendors would cause them to use the beach more. One participant at Durand even noted that such changes would likely cause them to use the beach less, presumably because it would detract from the natural setting that currently characterizes that beach. The beach survey included a question "why are you using this beach area instead of another beach today?" Additional analysis of these open-ended responses may provide a better sense of what features attract beach users. However, anecdotal responses from participants and observations by project staff suggest that although many beach users choose their beach by convenience, many also select the beach they visit based on the features of the area.

Users at Durand Beach felt much more strongly than Ontario Beach users that they would use the beach more often if there were better public facilities. The current difference between beaches is clear: facilities at Ontario Beach include a bathhouse with changing areas, restrooms, and pavilions for shade. Durand Beach, however, has no bathhouse and only temporary restroom facilities. Durand users expressed much less interest in shops and other services, however.

Water Quality

Responses about water quality generally supported anecdotal reports and observations by beach staff and the survey team. Users at both beaches reported that better water quality would cause them to use the beach more often. Unsurprisingly however, Ontario Beach respondents more strongly agreed that they would use the beach more often if water quality were improved. Water quality conditions at this beach are typically poorer than at Durand, largely due to issues with algae control. Because of this, Ontario Beach is closed more often than Durand is, and often has a distinct odor from algae decay. Supporting this observation, Ontario beach users felt more personally affected by odor. Ontario respondents also answered that they were more personally affected by other water quality issues including beach closings and too much algae. Users at both beaches were affected by these issues more than Monroe County residents (2009 WEC Survey) overall, as were public market survey respondents.

Access to Health-supportive Resources

A majority of people at both beaches reported being with friends and family, and were engaged in passive as well as active recreation. Providing opportunities for relaxation and recreation, Rochester's beaches may be viewed as a health supportive resource. Time spent with friends and family in a family-friendly environment can reduce stress and build social cohesion. About a third of survey respondents reported being with children under 16, indicating that the beach is an important resource for youth and children as well as adults.

Physical Safety

The survey team observed that visitors tended to congregate on the unguarded sections of beach at Durand even when a guarded option was available. It is not clear how management changes such as improved facilities and/or guarded areas would affect usage patterns and safety risks.

Conclusions

The survey results summarized in this report were collected to inform Healthy Waterways, a Health Impact Assessment of the City of Rochester's Local Waterfront Revitalization Program. The information collected will be used to develop recommendations for the City, particularly those related to future changes affecting water quality, beach facility improvements, land or water-based development near the beach, and water quality education.

Limitations

The data summarized in this white paper are limited by the small sampling size and survey times. Due to complications with weather, beach closings and scheduling, most surveys were collected on weekdays between 11am and 5pm, under-sampling weekend and evening times. It is likely that the demographics of survey respondents would differ if the survey team had been able to visit the beach at other times. We do not know if users who visit primarily on weekends or evenings have different perceptions of water quality and desirable beach features than weekday users. Limited resources also resulted in low survey response numbers (202 beach user surveys and 123 public market surveys completed), which limits the study's generalizability.

Replication

The surveys summarized above provided valuable baseline data. Replication of these efforts in future years might be valuable to document changes in user and non-user demographics, use patterns and behaviors, barriers to use, or perceptions if changes occur in the beach area. We recommend extended survey collection hours, particularly during evening times at the beaches, when the beach is officially closed, and on weekends to ensure that responses are gathered from all types of beach users. Surveying during the summer at the Rochester Public Market might also result in responses from a broader demographic. As noted above, we estimate a total of 56 hours were spent collecting, inputting, and analyzing 202 beach user surveys, and about 26 hours collecting, entering and analyzing 123 public market surveys. We recommend using a surveying team of at least two to maximize efficiency and for safety reasons.

Appendix 1 – Beach Survey

Location: _____ Date: _____ Time: _____
 Survey conducted by: _____ Weather: _____ SURVEY ID # _____

Beach: Ontario (open, during guarded hours) Durand (Area A, during guarded hours)
 Ontario (closed) Durand (not guarded; closed)

We are interested in beach use in Rochester. In this survey, “the beach” refers to the sandy beach and water. We are doing this survey at both Durand and Ontario (Charlotte); please answer for where you are and what you are doing today. You must be over 18 and have not taken this survey before to participate; you may skip any questions you wish.

- Today I am:** (check all that apply)?
 Swimming Picnicking Walking Sunbathing Playing sports Other: _____
- Do you plan to use the water today** (get wet above your knees)?
 Yes No Don't know
- Last summer, about how often did you use this beach area** (check only one)?
 Never 1 – 4 times 5 – 10 times 11 – 20 times 21 or more times
- Please check the seasons in which you use this beach area** (check all that apply):
 All year Summer Fall Winter Spring Don't Know
- How did you get to this beach today** (check all that apply)?
 Drove Walked Biked Took the bus Boat Other: _____
- How far did you travel to get to this beach today?** _____ miles
- Local address or intersection near your house** (If you prefer, give your own address)
 Street: _____ Number or cross street: _____
 City/State: _____ Zip: _____
 If you are from out of town, what is your home city? _____
- How long will you be at the beach today?** _____ hours
- Why are you using this beach area instead of another beach today?**

Use the following scale to rate your answers to the following statements:

1= Strongly Disagree (SD) 2 = Disagree (D) 3= Neutral (N) 4 = Agree (A) 5 = Strongly Agree (SA)

10. I would visit this beach MORE if it ...	SD	D	N	A	SA
... was better-maintained	1	2	3	4	5
... was safer	1	2	3	4	5
... was open (lifeguarded) more often/longer hours	1	2	3	4	5
...had better facilities (bathrooms/changing area)	1	2	3	4	5
...had better water quality	1	2	3	4	5
...had more shops/restaurants/vendors nearby	1	2	3	4	5
...nothing (I already use the beach as often as I want)	1	2	3	4	5
...had a spray park or swimming pool	1	2	3	4	5
Other: _____	1	3	3	4	4

11. I would use this beach LESS if it...	SD	D	N	A	SA
... had worse water quality	1	2	3	4	5
... had (higher) parking fees	1	2	3	4	5
... had fewer lifeguarded times	1	2	3	4	5
Other: _____	1	2	3	4	5

12. Following are some examples of ways County residents have been affected by the pollution of our local waterways. In the past year, have you been personally affected by:

Impact	Yes	no	maybe	don't know/ no answer
Beach closings				
Odor near waterways				
Zebra mussels				
Taste in drinking water				
Too much algae in water				
Too many weeds in the water (affecting boating)				
Getting sick after swimming in Lake Ontario				
Fish consumption advisories				

13. Do you ever check to see if the beach is closed due to water quality? YES NO

If NO, why not (check all that apply)?

- I don't get wet
 The water is safe enough
 I don't know how to check
 Other: _____

If YES, where do you look for this information (check all that apply)?

- Signs at the beach
 Radio/TV
 Newspaper
 Phone
 Other: _____

14. Do you or your family regularly eat fish caught in Ontario or connected waters? YES NO
 If YES, about how often do you eat locally caught fish? _____ meals per month

ABOUT YOU:

Who is here with you today (check all that apply)?

- Friends Family Children (under 16)
 By myself Dog Club or organization? _____

Race: White Black Asian Other: _____

Ethnicity: Non-Hispanic Hispanic or Latino

Age: _____ Gender: _____

How many people currently live in your household? _____ adults _____ children (under 18)

What is your approximate household income?

- Less than \$10,000 \$20,000 - \$24,999 \$35,000 - \$39,999
 \$10,000 - \$14,999 \$25,000 - \$29,999 \$40,000 - \$74,999
 \$15,000 - \$19,999 \$30,000 - \$34,999 \$75,000 or more

Do you have any additional comments? _____