

PUBLIC AWARENESS AND SUPPORT OF TOWN OF HEMPSTEAD PRESERVES AND NATURE AREAS

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ABSTRACT: *This study explores suburban residents' conservation awareness and commitment, and their knowledge and support of local preserves and nature areas; parks that have a clear focus on child play, sports, and recreation were not included in the study. The area of concern, the Town of Hempstead (ToH), is one of the three towns comprising Nassau County, New York, occupying 191.8 square miles in the southwestern portion of the county. The ToH has six designated preserves and nature areas: Norman J. Levy Park and Preserve, Marine Nature Study Area, Twin Lakes Preserve, Lido Beach Passive Nature Area, Tackapausha Museum & Preserve, and Theodore Roosevelt Nature Center. Adult participants involved in this study were recruited from the following Facebook Groups: Long Island Moms, Nassau County Moms, and Long Island Moms and Dads. Participants answered a 25-question survey to measure conservation awareness and commitment, as well as knowledge and visitations of local parks/preserves. Results show statistically significant differences in the number of preserves "heard of" and the frequency of preserve visits when comparing low vs. high conservation commitment score groups. When comparing low vs. high conservation awareness score groups, there was only a significant difference in frequency of visits, not for the number of parks "heard of." Survey respondents most often wrote, "nature," "enjoy," "quiet," and "beauty," as reasons for visiting nature preserves. It also appears that proximity to local nature preserves may not be the biggest motivation for visiting of the preserve.*

Keywords: *Town of Hempstead, environment, conservation, nature areas, preserves*

INTRODUCTION

Conservation Awareness and Commitment

Environmental changes and problems are generally considered paramount issues for both the scientific community and the general population. Environment-behavior research has shown society's increased concern for our environment (Dunlap and Van Liere, 1978; Fransson and Garling, 1999; Akehurst, Afonso, and Gonçalves, 2012; Steg et al., 2014). Research related to environmental awareness and commitment shows differences across sociodemographic categories, with general increases in concern over time (Fransson and Garling, 1999). Zelezny, Chua, and Aldrich (2000) examined the impact of gender on environmental attitudes and behaviors and the effect this may have had on social activism and, by extension, policy. In addition, a survey of post-graduate Indian students found science students to be more aware of the environment than those studying other subjects, with the arts having the lowest awareness (Sahu, et al., 2015). Further, a study by Bonnett and Williams (1998) found UK primary school students to have very positive attitudes towards nature and the environment. In addition, the concepts of environmental awareness (knowledge) and environmental action/behavior has been studied in great detail (Kollmuss and Agyeman, 2001; Bamberg and Schmidt, 2003; Han and Yoon, 2015).

The environmental issue that scientists often identify as a linchpin, is loss of biodiversity (Williams and Cary, 2002). Historically, those attempting to solve global issues such as habitat destruction, a main culprit of loss of biodiversity, tended to ignore the local component of the problem (Zube, 1991). In fact, studies (MORI, 1993; Uzzell et al., 1995) have found that children do not generally make connections between local actions and global environmental problems. However, in order to deal with global issues, one must understand and act at the local level much like the aphorism: "Think globally, act locally." At national, regional, state, and local levels, governments have established protected natural areas as a tool to deal with biodiversity loss. These protected areas may take the form of preserves, refuges, and nature areas. A great deal of research has been carried out regarding urban green spaces and attitudes of residents (Henwood and Pidgeon, 2001; Mehta and Heinen, 2001; Bonaiuto et al., 2003; Balram and Dragicevic, 2005). Hague and Siegel (2002) revealed a greater value placed on urban green spaces beyond utility and economics, as the establishment and maintenance of green places leads to greater conservation actions.

Environmental education for sustainable development was an effective approach on educating Indian students about biodiversity loss while also increasing their conservation awareness and encouraging these high school students to conserve and protect their local environment (Alexander and Poyyamoli, 2014). Further, Shobeiri, Omidvar and Prahallada (2007) carried out a study comparing the environmental awareness of secondary school students in Iran and India and found that 70% of students in both countries had high environmental awareness. Research about environmental awareness by Oguz, Cakci and Kavas (2010) showed that most university students in Ankara, Turkey were not able to explain and define the term “environment” in a full and correct manner. Educators and environmental specialists across the world have tried to draw attention to the fact that deeply rooting environmental awareness into education systems will be a solution to environmental problems (Shukla, 2009).

Sivek and Hungerford (1989/1990) described environmentally responsible behavior as the actions of an individual who advocates for preserving or conserving natural resources and decreasing the use of them. Research conducted by Lee (2011) discussed how individuals who are willing to support environmental conservation during a given time period are said to have a strong sense of conservation commitment. Similarly, a study completed by Kerstetter and Bricker (2009) found commitment towards the natural environment to be a critical predictor for environmentally responsible behavior. People who develop feelings of attachment to the nature around them (place attachment) can become more environmentally committed and lead to environmentally responsible behavior (Vaske and Kobrin, 2001).

This study explores suburban residents’ conservation awareness and commitment (as defined in part by Ballantyne et al. (2008)), and their awareness and support of local preserves and nature areas; parks that have a clear focus on child play, sports and recreation were not included in the study.

Study Area Background

The Town of Hempstead (ToH) is one of the three towns comprising Nassau County, New York, occupying 191.3 square miles in the southwestern portion of the county. The Town is comprised of 22 villages and 37 hamlets and in 2017 it had an estimated population of more than 772,000. This represents the majority of the county’s population and the largest of any town in New York. If Hempstead were to be incorporated as a city, it would be the second-largest city in New York, behind New York City; it would also be the 18th-largest city in the country. In addition, the median home value is 44% higher than the state average and median household income is 60 % higher than the state median (US Census Bureau, 2017).

According to the ToH Department of Parks and Recreation (2019), the ToH has one of the largest municipal park systems in the United States, with 90 total parks (1,404.05 acres) and 12,334 feet of beach front. In addition, the ToH has six designated preserves and nature areas: Norman J. Levy Park and Preserve, Marine Nature Study Area, Twin Lakes Preserve, Lido Beach Passive Nature Area, Tackapausha Museum & Preserve, and Theodore Roosevelt Nature Center. This study focused solely on Town-designated preserves and nature areas, as they are not geared towards athletics, sports fields, or child playgrounds (which are clear goals of the Town parks).

METHODS

Participants

The adult participants involved in this study were members of the following Facebook Groups: Long Island Moms (approximately 19,000 members), Nassau County Moms (approximately 10,000 members), Long Island Moms and Dads (approximately 2,500 members). Individual town or hamlet pages were not targeted in order to ensure sampling from the most diverse locations possible. Sample size power calculations yielded a need for 97 surveys in order to attain 95 % confidence ± 10 %. The survey (Appendix 1) was posted online in these Facebook groups as a link to a Google Form document. According to the United States Census Bureau of the Town of Hempstead taken from 2017, 63.9% of the population is Caucasian, 20.1% are Hispanic or Latino, 17.0% are black or African American and 6.0% are Asian. Ethnicity was not considered in the selection process or data analysis. A total of 155 surveys were completed. The majority of respondents (69%) identified as female, and 65.8% of respondents were born between 1965 and 1980 (Figure 1). This represents a limitation of the findings, but the demographics are consistent with previous research. In addition, as the survey was distributed via Facebook groups, the age distribution is consistent with that of Facebook users (Clement, 2019).

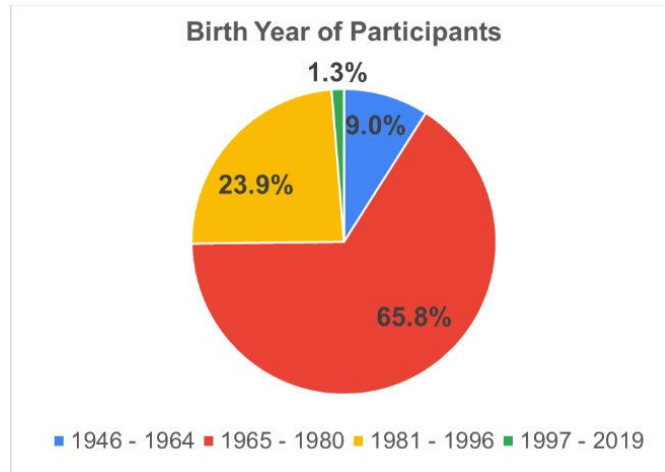


Figure 1. Birth year of participants grouped by generational group.

Research Design

The first three questions of the survey (Figure 1) elicit information on the participant's background, most importantly if s/he is a Town of Hempstead resident (non-residents were not considered for this paper) and respondent's age based upon generational group (e.g., Silent, Boomer, Gen X, Millennial, and Gen Z), as determined in 2019 by the Pew Research Center. Following this, questions 4 to 10 were slightly modified from Ballantyne et al. (2008), to ask about the participant's conservation awareness and the participant's conservation commitment. A Likert scale ranging from "doesn't describe me at all" (1) to "describes me perfectly" (7) was used. These conservation awareness scales and commitment scales have a Cronbach's alpha of 0.83 and 0.80, respectively. In addition, participants were asked how frequently they had visited the ToH preserves from the following range: never (zero times), infrequently (1 to 3 times) and frequently (four or more times). Respondents were then asked to write out the reason(s) they go to these green spaces, if applicable. Descriptive statistics were analyzed, a linear regression was carried-out (conservation awareness as a predictor of conservation action) and groups were compared using t-tests. Further text analysis was executed on an open-ended question ("What do you appreciate about and what are the reasons you go to green spaces like nature areas and preserves?"). Finally, ArcMap was used to determine population proximity to the 6 nature preserves. The data were primarily gathered from the NYS GIS Clearinghouse, Nassau County tax parcels, and the U.S. Census. The nature preserves were digitized from the tax parcels dataset to properly show the extent of each nature preserve. Next, two buffer analyses of 0.5 mile and 1.0 mile were performed around the nature preserves. A table join was then performed between population data by census block and spatial data of census blocks. Then, the census blocks within and intersecting each of the 0.5 mile buffers were selected, so that statistics could be run to determine total population within those buffers. The same was repeated for the 1.0 mile buffers.

RESULTS & DISCUSSION

Responses were high regarding conservation awareness statements, with 86.4% selecting between 5 and 7 (7 = "describes me perfectly") on the 7 point Likert scale for "I recycle at home," 51.7% selecting between 5 and 7 on the 7 point Likert scale for "I use environmentally friendly products," and 67.1% selecting between 5 and 7 on the 7 point Likert scale for "I am interested in learning about environmental issues." Conversely, responses leaned strongly toward 1 to 3 (1 = "doesn't describe me at all") for conservation commitment statements. For example, "I donate money to environmental organizations," yielded 63.8% of participants choosing between 1 and 3; "I do volunteer work for groups who help the environment," yielded 79.4% of participants choosing between 1 and 3; "I actively search for information about environmental conservation," yielded 65.8% of participants choosing between 1 and 3. Our findings of participants having higher conservation awareness than conservation commitment scores is consistent with those previously noted by Ballantyne (2008). This may be explained by environmentally conservative behaviors (conservation commitment) require taking action and devoting time, whereas conservation awareness does not require action or effort.

A regression and scatter plot, with a fitted line, was generated comparing conservation awareness and conservation commitment scores (Figure 2). Although the coefficient of determination between values is moderate ($R^2 = 33.7\%$), the relationship is significant ($p < 0.001$). Conservation awareness scores and conservation commitment scores were then compared to number of parks known to each respondent and frequency of parks visited by respondents (Tables 1 and 2). The mean conservation awareness score was 20.4 out of a total of 28, and the mean conservation commitment score was 7.6 out of 21. Each set of scores was broken down into two groups (low and high) based on the mean; scores below the mean were considered low, and scores above the mean were considered high. As with prior research (Ballantyne et al., 2008) awareness scores were generally very high, while commitment scores were very low. When comparing conservation awareness scores between low and high scoring groups, there was no significant difference in number of preserves known. The high conservation awareness score group was found to have a significantly higher knowledge of preserves in comparison to the low score group ($t(121) = -3.42, p < 0.05$). When comparing conservation commitment groups, high scorers displayed significantly higher knowledge of preserves ($t(152) = -2.06, p < 0.05$), and they showed a significantly greater frequency of visitation ($t(113) = -3.65, p < 0.05$).

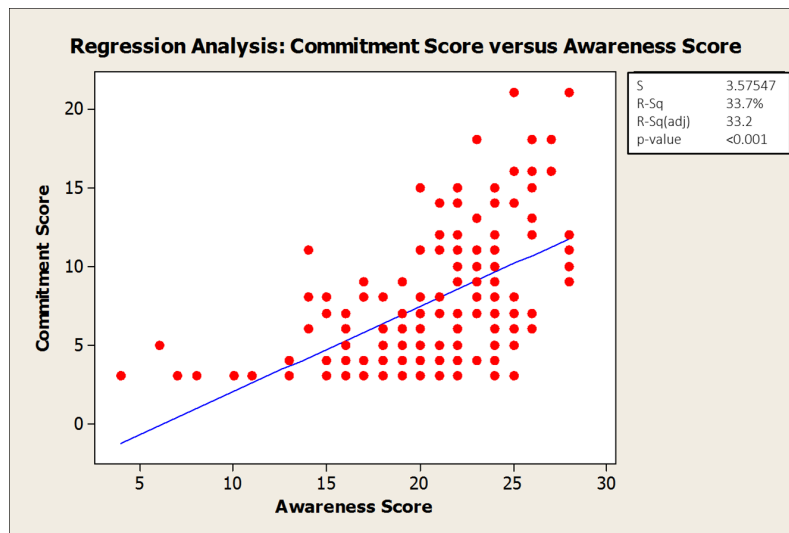


Figure 2: Regression fitted line plot: Conservation awareness vs conservation commitment scores.

An open-ended question was also included in the survey in order to gather information regarding the motivations for visiting these preserves (Table 3). The question asks: “What do you appreciate about and what are the reasons you go to green spaces like nature areas and preserves?” Of the 155 survey respondents, 104 chose to answer the optional free response question. Of those responses, 7 restated that they do not go to these types of locations, leaving 97 responses. An independent judge was assigned the task of creating categories for the given responses; two additional independent judges were tasked with categorizing the responses. Agreement between the judge’s categorization was extremely strong (Cohen’s kappa = 0.946). The two most common responses were related to relaxation and enjoying the environment and the least common response was interest in protecting the environment. This seems to support the data that showed low conservation commitment scores. Further, a word cloud was generated using Display software (Figure 3). Text analytics removed uninteresting and non-descriptives from the data set. The most frequently used terms “nature, enjoy, quiet, and beauty,” show the importance to respondents of relaxing and enjoying nature. One of the least common responses to the open-ended question was interest in protecting the environment. This may support the data that showed low conservation commitment scores, as the majority of the participants did not visit preserves with an interest in protecting the environment; they generally visited the green spaces for their own relaxation purposes.

Table 1. Locations of Study

	Norman J. Levy Park and Preserve	Marine Nature Study Area	Twin Lakes Preserve	Lido Beach Passive Nature Area	Tackapausha Museum & Preserve	Theodore Roosevelt Nature Center
Environmental Values	<ul style="list-style-type: none"> •52 acres •500-foot fishing pier •Tidal estuary 	<ul style="list-style-type: none"> •52 acres •Salt marsh ecosystem •Estuary •Osprey Platforms 	<ul style="list-style-type: none"> •58 acres •5 freshwater ponds •Flourishing bass population •Wet woodlands •Brown and Rainbow Trout stocked 	<ul style="list-style-type: none"> •40 acres •75% of the property is marshes •Tidal wetlands 	<ul style="list-style-type: none"> •84 acres •Largest White Cedar stand in Nassau County •170 bird species 	<ul style="list-style-type: none"> •Estuary •Dune environment
Historical Values	<ul style="list-style-type: none"> •Dedicated to New York State Senator Norman J. Levy •Opened to the public on October 20th, 2000 •Previously was a landfill 	<ul style="list-style-type: none"> •Park severely damaged by Hurricane Sandy •The park is divided into 8 different educational sections •Opened Earth Day 1970 	<ul style="list-style-type: none"> •Formed when Bellmore Creek was dammed prior to 1938 	<ul style="list-style-type: none"> •5-year plan to construct this preserve began in 2005 •NYSDEC plans to restore 2,200 acres of tidal wetlands 	<ul style="list-style-type: none"> •Land was given to Nassau County in 1938 for drainage purposes •August 2010 underwent a \$300,000 renovation 	<ul style="list-style-type: none"> •Former State Parks Commissioner Bernadette Castro transformed the land into a nature center in 2000 •The park was severely damaged by Hurricane Sandy
Geological Values	<ul style="list-style-type: none"> •Glacial outwash plain 	<ul style="list-style-type: none"> •Glacial outwash plain •Sandy sediments 	<ul style="list-style-type: none"> •Glacial outwash plain 	<ul style="list-style-type: none"> •Barrier Island 	<ul style="list-style-type: none"> •Glacial outwash plain 	<ul style="list-style-type: none"> •Barrier Island

Sources: Museums Nature. (n.d.); Norman J. Levy Park. (n.d.); Parks, Recreation and Historic Preservation. (n.d.); Preserves & Nature Areas. (n.d.); Tackapausha Museum and Preserve Nassau County, NY - Official Website. (n.d.); Tidal Wetland Assessment and Restoration. (n.d.); Twin Lakes Preserve. (n.d.); Upper Twin Pond, Wantagh. (n.d.)



Figure 3. Word cloud of key terms used in open ended question.

Table 2. T-test results comparing low and high conservation awareness and commitment on number of preserves known and frequency of visitation.

Preserves Known	n	Mean	SD	t-Value	df	p
Conservation Awareness						
Low	66	3.03	1.57	-1.54	149	0.125
High	89	3.45	1.8			
Conservation Commitment						
Low	91	2.88	1.54	-3.42	121	0.001
High	64	3.83	1.8			
Preserves Visited						
Conservation Awareness						
Low	66	2.24	2	-2.06	152	0.041
High	89	2.99	2.51			
Conservation Commitment						
Low	91	2.1	1.98	-3.65	113	<0.0001
High	64	3.48	2.54			

Finally, respondents were most familiar with Norman J. Levy Park and Preserve, as 68.4% stated they had heard of this nature area. Respondents were least familiar with the Marine Nature Study Area, as 62.6% stated they have not heard of this nature area. It was hypothesized that preserves with the greatest population within 0.5 and 1.0 miles would be the most well-known and visited preserves. GIS analysis (Figure 4) and the survey data point to other factors, not surrounding population size, likely being the driving force. As depicted in Table 7, the greatest population resides around Twin Lakes Preserve and Tackapausha Museum and Preserve, while the Theodore Roosevelt Nature Center has no one living within 1.0 miles of the location. Factors which may be impacting how well known, or how popular, these spaces are may be linked to the roadways they are located on, immediacy of public transportation, and proximity to other nearby attractions. For example, the Marine Nature Study area is located in the center of a suburban neighborhood, well off of any main roadway. By contrast, the Theodore Roosevelt Nature Center is located on the outskirts of Jones Beach, a popular NY State public beach. As a result of this, beachgoers may be exposed to signage for the preserve.

Table 3. Categorization, enumeration, and sample responses to open-ended survey question

What do you appreciate about and what are the reasons you go to green spaces like nature areas and preserves?					
Category	Relaxation	Family Time	Exercise	Interested in protecting the environment	To enjoy the environment
Responses	28	15	14	10	30
Sample Response	It's relaxing and rejuvenating.	Family time away from tech.	Nature trails are a good workout for a weekend morning.	Conservation and availability through generations	To appreciate nature and the outdoors.

(Cohen's Kappa = 0.946, 95% confidence interval: 0.894 – 0.998)

Table 7. Population surrounding Nature Preserves

Preserve	Population within 0.5 miles	Population within 1 mile
Tackapausha Museum and Preserve	25784	51430*
Norman J Levy Preserve	5148	19195
Twin Lakes Preserve	21740	51229*
Marine Nature Study Area	4002	14340
Lido Beach Passive Nature Area	879	2239
Theodore Roosevelt Nature Center	0	0
	Total (no overlaps)	Total (no overlaps)
	52439	125123

*Due to proximity Tackapausha & Twin Lakes double counted people

CONCLUSIONS

The demographics of the surveyed population (majority female, most born between 1965 and 1980) can be considered a limitation due to the low degree of heterogeneity. However, as mentioned, the distribution is representative of the distribution of Facebook users and meets sample size requirements. In order to collect information regarding why individuals visit nature areas and preserves, the following open response question was asked: “What do you appreciate about and what are the reasons you go to green spaces like nature areas and preserves.” Some of the popular terms that appeared in the responses were: nature, enjoy, peace, peaceful, relaxing, quiet, and beautiful. This information is valuable for decision makers, policy makers, and stakeholders seeking to preserve or establish green spaces.

For the sample population of this study, the data showed no difference between conservation awareness groups for having heard of parks, but there was a significant difference regarding frequency of park visits. Participants with high conservation awareness levels had significantly greater frequencies of park visits when compared to participants with low conservation awareness levels. These results may show that when action is required, conservation awareness level can influence conservation behavior. Furthermore, statistical analysis of the data from this study shows a moderate relationship between conservation awareness score and conservation commitment score. This may signify that an increase in conservation awareness leads to an increase in environmentally conservative behavior (conservation commitment). Policy makers and educators should take note of these results, and further work should be carried out to determine if these results hold true in younger school aged individuals. In regards to education and conservation, Jane Goodall once said: “Children can change the world. I tell this to my children, they are the hope.”

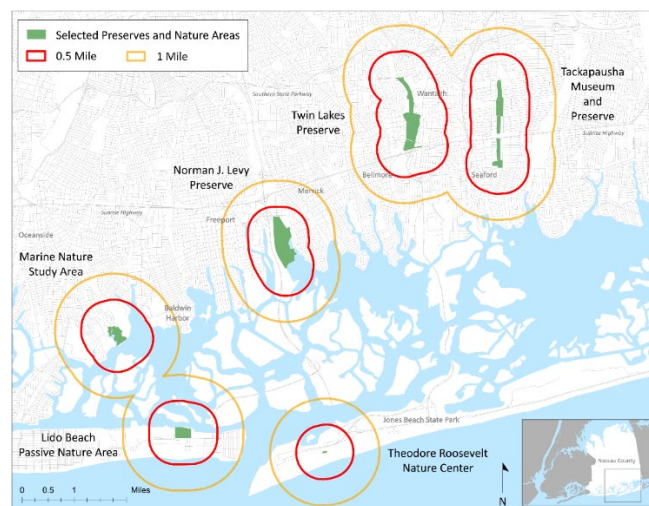


Figure 4. Location and population surrounding nature preserves.

As mentioned earlier, recent studies (Akehurst, Afonso, and Gonçalves, 2012; Steg et al., 2014; Taat, Charlie, and Saikim, 2018) have shown an increase in environmental concern among the general population. This goes back to the dictate, “Think globally, act locally.” The same rational can lead to inverting and adjusting that statement and posing the question, does acting locally lead to acting globally? Perhaps this can provide some insight as to how local behavior affects global behavior regarding environmental conservation. Can small scale conservation practices translate to a global conservation movement? Small scale conservation practices may in fact contribute to a larger global conservation movement. This is something that could be beneficial for local conservation education and policy development, and further investigation should be conducted. In addition, it is important to recall that the location of this study is a suburban area. It would be interesting to compare this to a nearby urban area, such as New York City, and a nearby rural area, such as the North or South Fork of Long Island. Lastly, during the editing process of this manuscript, the world is embroiled in a fight against a novel coronavirus (COVID19). As part of the battle against this virus, towns, cities, states, and countries have enacted social distancing rules, stay at home orders, sheltering in place declarations, and lockdowns. As time has progressed individuals have been seeking green spaces in tremendous numbers. It would be interesting to determine if this pandemic has affected the Town of Hempstead residents’ conservation awareness and commitment and their knowledge and support of local preserves and nature areas. Data could be collected and analyzed post COVID19 and compared to the existing pre-COVID19 data. Perhaps a stronger connection to nature and a greater desire for environmental conservation are some positives that may arise from this horrible pandemic.

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Appendix 1

- 1) By selecting “YES” on this form I am attesting that I have read and understand the information above and I freely give my consent to participate.
Yes
- 2) I am a resident of the Town of Hempstead (this includes:...)
Yes
- 3) I was born _____.
Before 1928
Between 1928 and 1945
Between 1946 and 1964
Between 1965 and 1980
Between 1981 and 1996
After 1997
- 4) Choose your sex
Male
Female
- 5) I use environmentally friendly products
Doesn’t describe me at all (1) to describes me perfectly (7)
- 6) I recycle at home
Doesn’t describe me at all (1) to describes me perfectly (7)
- 7) I am interested in learning about environmental issues
Doesn’t describe me at all (1) to describes me perfectly (7)
- 8) I often think about whether my actions harm the natural world
Doesn’t describe me at all (1) to describes me perfectly (7)
- 9) I donate money to environmental groups and organizations
Doesn’t describe me at all (1) to describes me perfectly (7)
- 10) I do volunteer work for groups who help the environment

- Doesn't describe me at all (1) to describes me perfectly (7)
- 11) I actively search for information about the environment
Doesn't describe me at all (1) to describes me perfectly (7)
- 12) I think there is enough green, undeveloped space in Town of Hempstead
Strongly Disagree (1) to Strongly Agree (5)
- 13) Have you ever heard of the following location?
Norman J. Levy Park and Preserve
Yes (skip to question 14)
No (skip to question 15)
- 14) How many times have you visited this location?
Never
Infrequently (1 to 3 times)
Frequently (4 or more times)
- 15) Have you ever heard of the following location?
Marine Nature Study Area
Yes (skip to question 16)
No (skip to question 17)
- 16) How many times have you visited this location?
Never
Infrequently (1 to 3 times)
Frequently (4 or more times)
- 17) Have you ever heard of the following location?
Twin Lakes Preserve
Yes (skip to question 18)
No (skip to question 19)
- 18) How many times have you visited this location?
Never
Infrequently (1 to 3 times)
Frequently (4 or more times)
- 19) Have you ever heard of the following location?
Lido Beach Passive Nature Area
Yes (skip to question 20)
No (skip to question 21)
- 20) How many times have you visited this location?
Never
Infrequently (1 to 3 times)
Frequently (4 or more times)
- 21) Have you ever heard of the following location?
Tackapausha Museum & Preserve
Yes (skip to question 22)
No (skip to question 23)
- 22) How many times have you visited this location?
Never
Infrequently (1 to 3 times)
Frequently (4 or more times)
- 23) Have you ever heard of the following location?
Theodore Roosevelt Nature Center
Yes (skip to question 24)
No (skip to question 25)
- 24) How many times have you visited this location?
Never
Infrequently (1 to 3 times)
Frequently (4 or more times)
- 25) What do you appreciate about and what are the reasons you go to green spaces like nature areas and preserves?

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