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# Measuring Complex Connections Between Conservation and Recreation: An Overview of Key Indicators



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## HUMAN DIMENSIONS RESEARCH UNIT PUBLICATION SERIES

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## EXECUTIVE SUMMARY

In 2012 and again in 2014, the authors were awarded funding through the Cornell University Agricultural Experiment Station for research that contributes to USDA NIFA Multi-State Project NE1962 (“Outdoor Recreation, Parks and Other Green Environments: Understanding Human and Community Benefits and Mechanisms”). The overall goal of our research was to demonstrate and expand the evidence for the role of park and outdoor recreation services in promoting community vibrancy and resilience. The project included an array of objectives focused on associations between nature-based recreation and participation in pro-environmental behaviors. This report focuses on one objective within that larger project: developing scales to measure constructs in a conceptual Conservation-Recreation model.

### Methods

We implemented 2 separate studies to pilot test and refine measures of concepts in the Conservation-Recreation Model, developed by Larson et al. (2014).

Study 1, conducted during 2013, was designed to target 3 populations: hunters, birdwatchers, and landowners (i.e., individuals who may or may not engage in hunting, birdwatching, or any form of nature-based recreation). We selected a random sample of 699 hunters living in 2 focal counties in New York State (Cattaraugus and Chenango), drawn from the 2012 hunting license records. We selected 1,261 landowners in the same counties by randomly identifying parcels in the 2010 GIS Clearinghouse database. We selected a sample of 1,982 birdwatchers from the membership and citizen-science databases at the Cornell Lab of Ornithology, drawing from the 2 focal counties plus 8 additional rural counties in upstate New York with similar demographic characteristics. Hunters and landowners were contacted through a mail survey; birdwatchers were contacted via a web-based survey. We collected survey data between April 2013 and May 2013 using a multiple mailing or e-mailing approach. Response rates were as follows: hunters 33% (n=227), bird watchers 38% (n=758), and landowners 38% (n=388). To test whether respondents were representative of the populations surveyed, 50 randomly selected non-respondents from each survey were contacted for a follow-up telephone interview in June 2013.

Study 2 focused on urban residents on Long Island, New York. The Survey Research Institute (SRI) at Cornell University was contracted to conduct a survey of outdoor recreationists at Rocky Point Natural Resource Management Area (NRMA). We collected survey data between March and April, 2015. We contacted all 2,117 recreationists who held a permit to access Rocky Point NRMA in 2013 and provided a valid email address on their permit application. Response rate was 33% (n=600). No nonrespondent interviews were completed for Study 2.

The survey instruments in both studies contained a common set of indicators for several key constructs in the Conservation-Recreation Model. Validity of scales to measure pro-environmental behavior (PEB) and other key constructs was assessed using principal component analysis (PCA) with orthogonal (Varimax) rotation in Version 20.0 of SPSS.

## **Results and Conclusions**

Our goal was to refine measures that future researchers can use to clarify the mechanisms by which involvement in local nature-based recreation may contribute to social and environmental dimensions of community resilience.

Results of principal component analyses demonstrated that the items tested in Study 1 and 2 yielded valid and practical scales to measure constructs in the Conservation-Recreation Model, including measures of: environmental place meanings, sociocultural place meanings, place attachment, pro-environmental behavior (PEB) (i.e., social environmentalism, environmental citizenship, conservation lifestyle), potential mediators of PEB (i.e., environmental concern, social norms, self-efficacy), community involvement, and community resilience. The indices described provide measures that can be confidently used in further analysis of hypothesized relationships in the Conservation-Recreation Model.

## ACKNOWLEDGMENTS

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## INTRODUCTION

A substantial body of research has highlighted a growing disconnect between people and nature and emphasized the negative ramifications of this trend for human well-being and environmental health (Kareiva, 2008; Kellert, 2005; Larson, Green, & Cordell, 2011; Louv, 2008; Pergams & Zaradic, 2008; Vorkinn & Riese, 2001; Zaradic, Pergams, & Kareiva, 2009). As the nature-deficit issue has become more prominent and publicized, numerous federal, state, and NGO-led initiatives have been developed to promote recreational activities that encourage contact of people with nature (Charles, Louv, Bodner, Guns, & Stahl, 2009). These efforts are beginning to consider another benefit associated with nature-based recreation: its potentially influential role in the development and maintenance of sustainable and vital rural communities (Schuster, Sullivan, Kuehn, & Morais, 2011).

Evidence suggests that community growth and development are often tied to the degree of connection individuals feel toward their communities and the places in which they live (Burnside, 2007; Lewicka, 2006; Pitzel et al., 2007; Warren, 2005; Zelenski, Dopko & Capaldi, 2015). Additional research is needed to extend these analyses and determine how interactions with natural amenities (e.g., outdoor recreation) affect rural community development. For instance, because nature-based activities may facilitate social interaction and positive connections between people and places (Peters, Elands & Buijs, 2010), they could play a major role in the community capacity-building process (Lauber, Stedman, Decker, Knuth, & Simon, 2011). Place-enhancing behaviors that protect valuable environmental assets are therefore essential to the resilience, health, and well-being of many impoverished rural (Barrett, Lee, & McPeak, 2005) and urban communities (Schilling & Logan, 2008). Although many outdoor recreation professionals now recognize that involvement in outdoor recreation can improve individual health, increase environmental literacy, and contribute to community resilience (USDA NIFA Multi-State Project NE1962 project, [www.nimss.org/projects/14756](http://www.nimss.org/projects/14756)), they also acknowledge that the mechanisms and conditions under which such outcomes are created are incompletely understood (Teisl & O'Brien, 2003).

A federal research project (USDA NIFA Multi-State Project NE1962, <http://www.nimss.org/projects/14756>) titled “Outdoor Recreation, Parks and Other Green Environments: Understanding Human and Community Benefits and Mechanisms” was established to promote research collaborations that fill gaps in understanding about outdoor recreation and benefits to society. The long-term goal of the project is to build a knowledge base that will help communities to capture more of the potential societal benefits associated with outdoor recreation. In 2012<sup>1</sup> and again in 2014<sup>2</sup>, the authors were awarded funding through the Cornell Agricultural Experiment Station, for research that contributes to USDA NIFA Multi-State Project NE1962. The overall goal of our research was to demonstrate and expand the evidence for the role of outdoor recreation in promoting community vibrancy and resilience.

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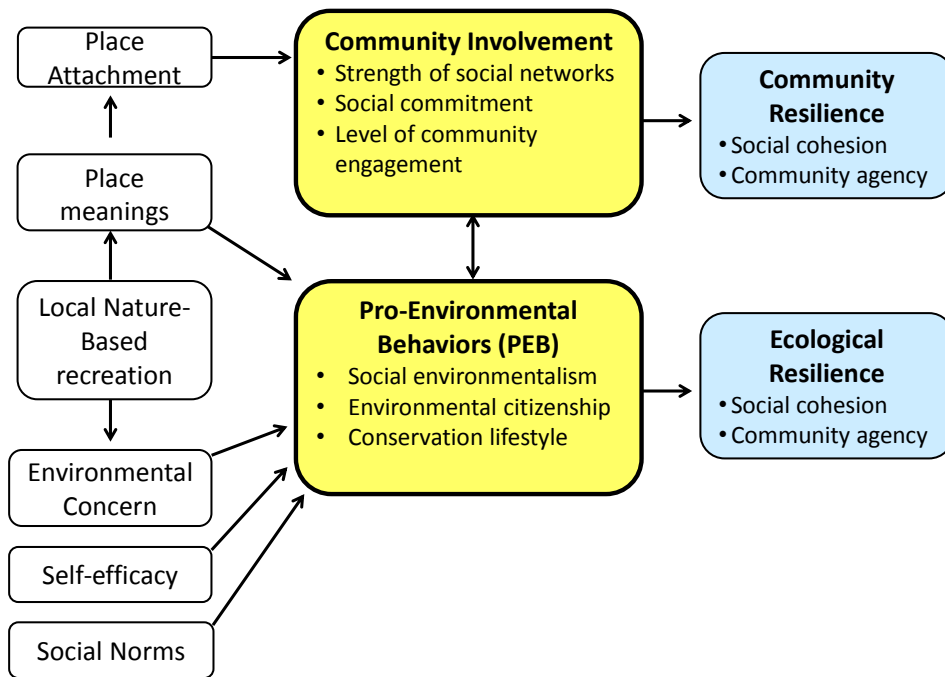
<sup>1</sup> Hatch/Multi-state Project 147477 (Title: Improving contributions of local, nature-based recreation to sustainable environmental quality of rural communities).

<sup>2</sup> Hatch/Multi-State Project NYC-147815 (Title: Revealing the potential of national wildlife refuges to foster conservation recreation and resilience in local communities).



Our related projects, which were conducted in 2 different regions of New York State (rural, economically distressed communities in upstate New York and urban, economically thriving communities on Long Island), included an array of objectives focused on associations between nature-based recreation and participation in pro-environmental behaviors (PEBs). This report focuses on one objective within that larger project: developing scales to measure constructs in a conceptual model (the Conservation-Recreation Model) that explores complex connections between nature-based recreation and conservation or place-enhancing behaviors. We describe results from 2 separate studies where we tested measures in the hypothesized Conservation-Recreation Model. Our goal was to refine measures that can be used in future research to clarify the mechanisms by which involvement in local nature-based recreation may contribute to social and environmental dimensions of community resilience.

Key constructs within the Conservation-Recreation Model, developed by Larson et al. (2014), are described in Figure 1. Arrows in Figure 1 are used to indicate hypothesized relationships between model constructs. The figure illustrates hypotheses that participation in local nature-based recreation enhances sense of place (place meanings and place attachment), which ultimately influences an individual's participation in PEB and community involvement. We regard community involvement as a potential contributor to social aspects of community resilience. We regard pro-environmental behavior (PEB) as a potential contributor to ecological



**Figure 1.** Hypothesized relationships between local nature-based recreation, pro-environmental behaviors, community involvement, and community resilience (adapted from Larsen et al. 2014).

aspects of community resilience. Larson et al. (2014) recommended that future investigations explore relationships in the Conservation-Recreation Model by constructing and testing scales to measure the constructs being considered, ranging from important outcomes such as pro-environmental behavior (PEB) and community involvement to potential predictors such as recreation behavior, place attachment, socio-demographic attributes, and other social and cognitive correlates of behavior (e.g., environmental concern, self-efficacy, social norms). Our research acts on recommendations in Larson et al. (2014) by developing indicators of the constructs in the Conservation-Recreation Model.

## **METHODS**

Our process of Conservation-Recreation Model scale development featured 2 related studies designed to span unique geographic contexts. The first study focused on rural residents of counties in upstate New York. The second study focused on urban residents on Long Island, New York. The survey instruments in both studies contained a common set of indicators for several key constructs in the Conservation-Recreation Model developed by Larson et al. (2014). In this section we describe measurement of key constructs, study sites and survey implementation, and analyses used in each study.

### **Study Sites and Sample Selection**

Study 1, conducted during 2013, focused on multiple rural counties in upstate New York. Study 1 was designed to target 3 populations: hunters, birdwatchers, and landowners (i.e., individuals who may or may not engage in hunting, birdwatching, or any form of nature-based recreation). We randomly selected 699 hunters living in 2 focal counties (Cattaraugus and Chenango), drawing from 2012 hunting license records provided by the New York State Department of Environmental Conservation. We selected a sample of 1,982 birdwatchers from the membership and citizen-science databases at the Cornell Lab of Ornithology, drawing from the 2 focal counties plus 8 additional rural counties in upstate New York with similar demographic characteristics. We selected 1,261 landowners in the 2 focal counties by randomly identifying parcels in the 2010 GIS Clearinghouse database.

Study 2, conducted during 2015, focused on Rocky Point Natural Resource Management Area (NRMA), which is located in north-central Suffolk County, New York. Rocky Point NRMA is managed by the New York State Department of Environmental Conservation (DEC). It is approximately 6,000 acres in size and contains pine-oak forest, ponds, open fields, and 25 miles of trails for hiking, horseback riding, and mountain biking. Located in one of the most densely populated regions in New York State (current population Suffolk County  $\cong$  1.5 million), Rocky Point NRMA is managed, in part, to provide outdoor recreation opportunities (DEC, 1995). All recreationists at Rocky Point must obtain a seasonal access permit (provided free of charge and valid for 3 years). We drew our sample from records of people holding 2013 permits for recreation access to Rocky Point NRMA (the most recent year for which electronically-accessible data was available). DEC staff provided 3,138 records for 2013 permit holders. We were interested in local recreationists, so we removed 2013 permit holders who resided outside

Suffolk County (n=596). The final sample size (i.e., Suffolk County residents with a valid email address) was 2,117.

## **Measures of Key Constructs**

Assumed relationships between constructs in Figure 1 are rooted in social-psychological theories of behavior including the Theory of Planned Behavior (Hrubes, Ajzen, & Daigle, 2001), the theory of Reasoned Action Approach (Ajzen & Albarracin, 2007), and Value-Belief-Norm Theory (Stern, 2000). Development of specific indices are described in the following sections.

### **Nature-based recreation**

Several studies have shown that positive exposure to the natural environment through participation in outdoor recreation is correlated with pro-environmental attitudes, environmental awareness, and support for conservation (Kareiva, 2008; Manfredi, 2008; Tarrant & Green, 1999). Others have found that participation in various forms of outdoor recreation may be a significant predictor of pro-environmental behavior (Zaradic, Pergams, & Kareiva, 2009; Larson, Whiting, & Green, 2011; Cooper, Larson, Dayer, Stedman, & Decker, 2015).

Our research focused on a subset of outdoor recreation activity that is nature-based or wildlife-dependent. In Study 1, we focused on 2 wildlife-dependent activities: bird watching and hunting. In Study 2, we focused on 3 wildlife-dependent activities (i.e., fishing, hunting, and bird watching) and 4 nature-dependent activities (i.e., mountain biking, hiking, canoeing/kayaking, horseback riding).

In both studies we asked respondents how often they had participated in these activities over the 12 months prior to the survey. In Study 1, we also asked respondents what percentage of time spent in these recreation activities occurred within a 30-minute drive of their home. In Study 2, we asked respondents how often they participated in each activity at Rocky Point NRMA or elsewhere in Suffolk County.

In Study 1, a 2-step process was used to classify respondents into 1 of 4 categories of recreation specialization (i.e., hunter, birdwatcher, birdwatcher-hunter, and non-recreationist). Respondents were placed in a specialization category based on their self-identified favorite activity (i.e., the activity they enjoyed the most) and their self-reported activity levels (i.e., whether their level of participation exceeded the group mean level of participation in that activity).

Based on previous research examining links between recreation behaviors, sense of place (Bricker & Kerstetter, 2000; Ditton, Loomis, & Choi, 1992), and pro-environmental behavior (McFarlane & Boxall, 1996; Oh, Ditton, Anderson, Scott, & Stoll, 2005), we hypothesized that respondents who spend more time recreating outdoors locally would display stronger local place attachment and PEB.

## Sense of place

Sense of place refers to the entire group of cognitions and affective sentiments people hold regarding a particular geographic locale, including the meanings one attributes to a place (Farnum, Hall, & Kruger, 2005; Jorgensen & Stedman, 2001, 2006). Ongoing efforts to operationalize, implement, and interpret place-based constructs have resulted in a general conceptual framework where the formation of place meanings (a cognitive dimension that includes both environmental and sociocultural elements) influences place attachment (an affective and cognitive dimension that includes both place identity and place dependence). An individual's satisfaction with various aspects of place may affect their bond to that particular setting.

Participation in local nature-based recreation generates place-based experiences, which may contribute to place meanings and subsequent place attachment. We hypothesize that place attachment will in turn influence community involvement and PEB. Strong bonds to place could cultivate a proactive sense of empowerment and civic responsibility that inspire local nature-based recreationists to become more involved in efforts to protect the socio-ecological integrity of the place where they live (Manzo & Perkins, 2006; Uzzell, Pol, & Badenas, 2002). Place meanings and place attachment may therefore have direct and indirect effects on PEB.

*Place Meanings.* Place meaning “refers to the symbolic meanings that people ascribe to settings” (Kudryavtsev, Stedman, & Krasny, 2012, page 232). As such, they are distinct from the evaluative components of attachment (Stedman, 2002). Place meanings can be derived from a variety of sources including interaction with the environment and the interconnectedness of environmental features, psychological developments, and sociocultural processes (Altman & Low, 1992; Ardoin, 2006).

The survey instrument for Study 1 included 5 items to assess *environmental place meanings* and 5 items to assess *sociocultural place meanings*. Study 2 used 8 of those 10 items; one of the items to assess sociocultural place meanings (i.e., My local area is peaceful) was not retained in Study 2 because it did not load well onto the sociocultural place meanings factor. The other item (i.e., My local area has many people who share my values) was dropped to reduce scale length. All items were written as belief statements with 5 response options (strongly disagree, disagree, neutral, agree, and strongly agree). The items are part of a typology of place meanings developed by Ardoin and colleagues to measure the distinct environmental and sociocultural aspects of place (Ardoin, 2006; Ardoin, Schuh, & Gould, 2012).

*Place Attachment.* **Place attachment** has been defined as the psychological, affective bond that an individual forms with a particular setting (Kudryavtsev et al., 2012). These bonds are influenced by the values people ascribe to a place (i.e., place meanings). Studies have shown that emotional connections to place and a strong sense of place attachment can motivate efforts to engage with and protect local communities (Heimlich & Ardoin, 2008; Kudryavtsev et al., 2012; Manzo & Perkins, 2006). Others have found connections between place attachment and participation in environmentally significant behaviors that promote resource protection and preservation (Alam, 2011; Bricker & Kerstetter, 2000; Halpenny, 2010; Hinds & Sparks, 2008; Kyle, Graefe, Manning, & Bacon, 2004; Walker & Ryan, 2008). However, place attachment

alone may not be sufficient to explain the relationship between an affective connection with place and PEB. Research suggests that PEB participation may be more likely when attachment exists *and* important place meanings are threatened (Stedman, 2002).

The survey instrument for Study 1 included 10 items to assess place attachment; 7 of those items were retained to assess place attachment in Study 2 (1 item was dropped because it did not load well onto the place attachment factor; 2 items were dropped to reduce scale length). All items were written as belief statements with 5 response options (strongly disagree, disagree, neutral, agree, and strongly agree). The items explore 2 distinct dimensions of place attachment that have been identified in numerous studies (Jorgensen & Stedman, 2006; Kyle, Graefe, & Manning, 2005; Williams, Patterson, & Roggenbuck, 1992). *Place identity* describes the affective or emotional connection that people share with a place, or the way in which an individual views him/herself in relation to that place (Proshansky, 1978; Stedman, 2003; Wynveen, Kyle, Absher, & Theodori, 2011). *Place dependence* refers to personal connections based on activities that occur in an area (i.e., functional utility) and the value of a place relative to alternative settings (i.e., resource specificity) (Farnum et al., 2005; Jorgensen & Stedman, 2006; Kyle et al., 2005).

### **Pro-environmental behavior (PEB)**

Pro-environmental behaviors (PEB) are actions that benefit the natural environment or enhance environmental quality (Steg & Viek, 2009; Larson et al., 2015). Underlying many programmatic efforts to encourage outdoor recreation is the implicit assumption that engagement with the natural environment will ultimately stimulate greater expression of PEB, but few studies have measured the relationships between wildlife-dependent recreation and PEB (Teisl & O'Brien, 2003). Outdoor recreation researchers need simple measures of PEB's that they can use to test those assumptions in specific contexts (e.g., in a specific park or community). Moreover, they need indices that reflect the multi-dimensional nature of the PEB construct (Larson et al., 2015).

Stern (2000) distinguished between 3 types of environmentally-significant behavior: (1) committed environmental activism (e.g., participating in pro-environment demonstrations), nonactivist behaviors in the public sphere (e.g., signing petitions, joining or contributing to environmental groups), and private-sphere environmental behaviors (e.g., recycling packaging at home, purchasing "green" cleaning products). In this study, we were interested in both public-sphere and private-sphere pro-environmental behaviors, including locally-based environmental citizenship (e.g., volunteer community service) and personal conservation lifestyle activities (e.g., recycling).

Study 1. Larson et al. (2015) developed 15 items to assess dimensions of PEB, including *conservation lifestyle behaviors*, *social environmentalism*, and *environmental citizenship*. Items assessed the frequency with which respondents engaged in these activities "to improve the quality of your local area" (response options: never, rarely, sometimes, often, very often).

Study 2. This study replicated 12 (and replaced 3) of the 15 items used in Study 1. Respondents were offered the same response options used in Study 1. Three items intended to assess the social environmentalism dimension of PEB in Study 1 (i.e., participated in a wildlife study, participated in a citizen science project, talked to others about the benefits of wildlife recreation activities)

were replaced with items specific to the local context of Study 2. The replacement items were: participated in a citizen science project; volunteered to maintain local hiking, biking, or horse riding trails; and volunteered my time at Wertheim National Wildlife Refuge.

### **Environmental concern**

Expression of environmental concern is closely linked to underlying values (Schultz, 2001), and these attitudes/concerns enable individuals to assess and evaluate consequences associated with particular actions (Poortinga, Steg, & Vlek, 2004; Schultz et al., 2005). Consequently, environmental concern is often considered to be a precursor to environmental activism. In a local context, this concern may motivate various forms of PEB.

In Study 1, 4 items adapted from the “ecological crisis” and “balance of nature” constructs on the New Ecological Paradigm Scale (Dunlap, Van Liere, Mertig, & Jones, 2000) were developed to assess respondents’ level of concern about their local environment. All items were written as belief statements with 5 response options (strongly disagree, disagree, neutral, agree, and strongly agree). With knowledge of results from Study 1, in Study 2 only 2 of the 4 items were used to assess concern (i.e., the natural environment in my natural area is a) threatened by human activities; b) currently suffering ecological damage).

### **Self-efficacy**

Self-efficacy, or locus of control, is an essential element in behavior models (Fishbein, 2008; Hines, Hungerford, & Tomera, 1986; Oreg & Katz-Gerro, 2006). Self-efficacy refers to one’s personal and situational answer to the question, “Am I able to act?” If an individual does not believe that he/she possesses the skills or ability to complete a task and achieve a desired outcome in a particular context, then it is unlikely he/she will participate in that behavior. Self-efficacy is therefore an important antecedent of PEB.

In both studies we used 2 items to assess sense of self-efficacy. These items were written as belief statements with 5 response options (strongly disagree, disagree, neutral, agree, and strongly agree). One item (i.e., My actions can make a difference) was identical in both studies. The second item (i.e., There is not much I can personally do to help) was modified for use in Study 2 (i.e., There are things I can do to help).

### **Social Norms**

Norms depict social influence or “the amount of pressure that people perceive they are under from significant others to perform a specific behaviour” (Smith & Louis, 2008, page 648). Norms emerge from social networks and interactions and profoundly influence individual actions. Norms can be split into 2 categories: *injunctive* norms (i.e., perceptions about how people “ought” to act) and *descriptive* norms (i.e., perceptions about how people actually act) (Cialdini, Kallgren, & Reno, 1991; Minato, Curtis, & Allan, 2010). Both types of norms can create a sense of civic duty and obligation to act (Gramann & Vander Stoep, 1987; Kaiser, Hubner, & Bogner, 2005), and both are relevant in the context of PEB.

We used 2 items to assess respondent's *descriptive* norms. The items assessed beliefs about social norms in their community toward protecting the local environment. The items were written as belief statements with 5 response options (strongly disagree, disagree, neutral, agree, and strongly agree). In Study 2, a specific geographic referent was added (i.e., the items asked about protecting the environment specifically in Suffolk County).

### **Community involvement**

Social capital (i.e., the construction of cooperative networks and an engaged citizenry) is thought to play a critical role in community resilience and vitality (Cavaye, 2001; Driskell & Lyon, 2002; Marquart-Pyatt & Petrzela, 2008). Social capital is created through social networks and community involvement that build linkages and subsequent capacity for natural resource management (Putnam, 1993; Cavaye, 2001; Warner, 2001; Perkins & Long 2002).

We hypothesize that participation in local nature-based recreation can lead to new interactions with other people and thus can contribute to the number and strength of ties in a recreationist's personal social networks. Increasing number and strength of personal ties may lead to a stronger sense of community belonging and community capacity for positive change. Those perceptions may in turn lead to greater interest in taking actions to protect local natural resources, and ultimately to increased levels of personal involvement in community activities.

The concept of community involvement can be parsed into several dimensions, including strength of local social networks, social commitment (i.e., sense of personal responsibility to contribute to the local community), and social engagement (i.e., level of involvement in community events and activities).

We explored 2 dimensions of community involvement (in Study 2 only). We used 5 items to assess strength of *social networks* and 2 items to assess *social commitment* (i.e., interest in taking actions to protect local water quality or open space). All items were written as belief statements with 5 response options (strongly disagree, disagree, neutral, agree, and strongly agree). We used 1 item to measure level of community engagement (i.e., how involved are you in community activities?). This item had 5 response options (i.e., not involved, slightly involved, moderately involved, extremely involved, very involved).

### **Community resilience**

Community resilience is often defined as “the existence, development, and engagement of community resources by community members to thrive in an environment characterized by change, uncertainty, unpredictability, and surprise” (Magis, 2010). Communities can build resilience by enhancing residents' agency and their capacity to self-organize to collectively respond to change and develop new future trajectories. Social networks fostered by people-place connections can be a critical part of this collective response to change (Berkes & Ross, 2013).

We explored 2 dimensions of community resilience (in Study 2 only) that have been identified as key dimensions in previous studies (Magis, 2010). We developed 4 items to assess perceived *community cohesion* (i.e., perception of how well community members accept and get along

with one another) and 6 items to assess perceived *community capacity* to respond to change (i.e., sense of whether the community has the capacity to work together to adapt and respond to change). The items were written as belief statements with 5 response options (strongly disagree, disagree, neutral, agree, and strongly agree).

## **Survey Implementation**

### **Study 1**

Cooper et al. (2015) provided a comprehensive description of survey implementation for Study 1. Some of those details are repeated here.

In an effort to contact a range of nature-based recreationists while simultaneously focusing on hunters and birdwatchers, Study 1 used a hybrid approach; hunters and landowners were contacted through a mail survey and birdwatchers were contacted via a web-based survey. All survey data were collected between April 2013 and May 2013 using a multiple mailing or e-mailing approach with 4 separate contacts at 1-week intervals (Dillman, 2007). On the second week after initial contact, non-respondents received either a reminder postcard or email. On the third week, non-respondents received another copy of the initial questionnaire via mail or web link, followed by either a reminder postcard or email after 1 additional week.

The hunter mail survey produced a 33% response ( $n=227$  completed questionnaires). The landowner mail survey produced a 38% response ( $n=388$  completed questionnaires). The web-based survey of birdwatchers produced a 38% response ( $n=758$ ). After excluding returns from birdwatchers who were not residents of the study area ( $n=112$ ), the number of usable completed questionnaires was reduced to 646.

After aggregating respondents from the hunter, birdwatcher, and landowner samples ( $n = 1,261$ ), those who provided incomplete responses on PEB items ( $n=320$ ) were deleted from the analysis, resulting in an effective sample size of 941 respondents. To test whether respondents were representative of the populations surveyed, 50 randomly selected non-respondents from each survey were contacted for a follow-up telephone interview in June 2013. The telephone follow-up focused specifically on activity participation and demographics and represented a subset of the larger questionnaire. No statistically significant differences were found between respondents and non-respondents in terms of participation rates in the respective wildlife recreation activities. Demographic ratios among respondents and non-respondents in the hunter and landowner categories were comparable; in the birder sample, non-respondents were slightly older and significantly more likely to be male than respondents.

### **Study 2**

The Survey Research Institute (SRI) at Cornell University was contracted to conduct a survey of outdoor recreationists at Rocky Point NRMA. Invitation e-mails were sent out to 2013 access permit holders on March 13<sup>th</sup>, 2015. Reminder e-mails were sent to all non-respondents on March 19<sup>th</sup>, March 26<sup>th</sup>, and April 2<sup>nd</sup>, 2015. Data collection ended on April 13<sup>th</sup>, 2015. In total, 600 participants completed the survey out of a possible 2,117 with valid emails. Additionally, 99



participants started the survey, answered at least one question, but not did not complete it. The 699 returns represent a 33% response rate. Because this study was not conducted to make generalizations about the population of recreationists at Rocky Point NRMA, a nonrespondent follow-up study was not completed.

## **Analysis**

Validity of scales to measure PEB and other key constructs was assessed using principal component analysis (PCA) with orthogonal (Varimax) rotation in version 20.0 of SPSS. PCA is a multivariate statistical technique designed to reduce the number of variables in a data set into a smaller number of meaningful dimensions or categories (Vyas & Kumaranayake, 2006). Although other data-reduction techniques such as principal axis factoring with oblique rotations would have more effectively accounted for potential relationships among scale items (Costello & Osborne, 2005), we chose to use PCA because (a) it is widely recognized as an effective tool for uncovering the underlying structure of a scale or construct and (b) it is easier to interpret than many other factor analysis strategies. Prior to analysis, the Kaiser–Meyer–Olkin measure of sampling adequacy and Bartlett’s test of sphericity were conducted to determine if a PCA was appropriate (Green & Salkind, 2008). Following suggestions from other researchers (Vyas & Kumaranayake, 2006), we extracted only factors with eigenvalues >1 and those that survived the scrutiny of Catell’s scree test, underscoring their unique and meaningful contribution to overall scale variance. We created aggregate scores for key variables and/or subdimensions (e.g., environmental place meanings, self-efficacy) by calculating the grand mean for items within each factor in a scale that had an eigenvalue of 1.0 or higher. Within each factor, we retained items with factor loadings of 0.6 or higher.

In addition to construct validity assessments with PCA, we also explored the reliability of scales using Cronbach’s alpha ( $\alpha$ ), a statistic used to measure the internal consistency for scales with 2 or more items (Bland & Altman 1997). Social science scales with alpha values of 0.7 or higher are generally considered to be reliable (Bland & Altman 1997). Although some researchers have recently called for more comprehensive and multifaceted reliability analyses (Vaske, Beaman & Sponarski, 2016), Cronbach’s alpha remains a standard measure of internal consistency, particularly when used as a post hoc tool following exploratory factor analyses or PCA examining scale dimensionality (as described above).

## **RESULTS & DISCUSSION**

In this section, we summarize and discuss results from both studies to present reliable and valid scales that could be used in the future to measure key constructs in the Conservation-Recreation Model. Multivariate structural analysis of the model and the pathways connecting these variables is an important step for future research, but it falls beyond the scope of this report.

### **Nature-based Recreation**

Study 1 focused on samples of hunting license holders and persons who belonged to a bird-related organization or participated in bird-related citizen-science projects. Consequently, a vast majority of respondents were either birdwatchers, hunters, or individuals who engaged in both

activities (68.4% of the sample had participated in birdwatching, and 36.3% of the sample had participated in hunting, in the past 12 months). Many of the respondents had engaged in these activities for 10 or more days in the past 12 months, meaning they were more than casual participants. Although many participants (67.7%) had also participated in “other nature-based recreation activities (e.g., hiking, camping, canoeing, etc)” in the past 12 months, less than 5% indicated one of these other activities was their favorite. Less than 10% of respondents preferred no outdoor activities. In other words, the Study 1 sample consisted of outdoor recreation enthusiasts, many of whom were particularly passionate about birdwatching and/or hunting.

Study 2 focused on outdoor recreationists who had a permit to access Rocky Point NRMA for recreation purposes. Nearly all respondents (98.3%) had participated in outdoor recreation in Suffolk County New York in the past 12 months. They were most likely to have participated in hiking (64.3%), mountain biking (48.3%), fishing (37.6%), canoeing/kayaking (36.3%), or hunting (32.4%). They were less likely to have participated in bird watching (21.9%) or horseback riding (5.1%). As in Study 1, many respondents in Study 2 also were more than casual participants. For example, among those who engaged in mountain biking the average days spent biking was 40.6 days per year. In contrast to Study 1, birdwatchers in Study 2 were less avid (mean days of bird watching among birdwatchers in Study 2 was 33.3 days per year, compared to a mean of 190 days per year among birdwatchers in Study 1).

These descriptions are presented to provide some additional context regarding the respective study samples. Although we are interested in understanding how different types of recreation behaviors influence different outcomes (e.g., sense of place, PEB) in the Conservation-Recreation Model, those analyses are beyond the scope of this study. Our focus here is on scale development.

### **Place Meanings**

In Study 1, PCA revealed a 2-factor model that accounted for 60.3% of the total variability across the 9 sense of place items. The factors were labeled environmental place meanings (5 items, Cronbach's  $\alpha = 0.839$ ) and sociocultural place meanings (4 items, Cronbach's  $\alpha = 0.816$ ; Table 1).

In Study 2, PCA revealed a 2-factor model that accounted for 69.0% of the total variability across the 8 sense of place items. We labeled the factors environmental place meanings (5 items, Cronbach's  $\alpha = 0.867$ ) and sociocultural place meanings (3 items, Cronbach's  $\alpha = 0.813$ ; Table 1).

In both studies, respondents held strong place meanings, with most agreeing or strongly agreeing with all environmental place meaning items, and a majority agreeing with 3 sociocultural place meaning items used in both studies. In both contexts, environmental place meanings appeared to be more powerful than sociocultural place meanings.

In future studies, it would be valuable to sample populations of recreationist who are expected to exhibit more variation in strength of place meanings. Studies focused on more heterogenous

samples of people would help verify that the implications of scale development will hold across subpopulations.

### **Place Attachment**

In Study 1, PCA analysis revealed a 1-factor model that accounted for 67.5% of the total variance in the place attachment scale (9 items, Cronbach's  $\alpha = 0.939$ ; Table 2). One reverse-coded item (There are better places to be than here) was deleted to improve factor structure.

In Study 2, PCA revealed a 1-factor model that accounted for 73.4% of the total variance in the place attachment scale (7 items, Cronbach's  $\alpha = 0.939$ ; Table 2).

It should be noted that multidimensional structure of place attachment described in previous research (e.g., Jorgensen & Stedman, 2006; Kyle et al. 2005) was not evident in either study, with both the place identity and place dependence items grouping into a single unidimensional construct. Attachment to place differed in each study. In the rural areas of Study 1, respondents generally expressed higher levels of place attachment and a majority of individuals agreed with every statement. In the more urban region of Study 2, a wider range of responses was observed.

### **Pro-Environmental Behavior**

In Study 1, PCA with 12 of the 15 items in the scale revealed a 3-factor model that accounted for 65.0% of the total variance. Three items from the initial set of 15 were dropped<sup>3</sup> from the analysis because factor loadings were low ( $< 0.4$ ) and item content did not align with any particular dimensions of PEB. The factors that emerged in the PCA were labeled social environmentalism (5 items, Cronbach's  $\alpha = 0.840$ ), environmental citizenship (4 items, Cronbach's  $\alpha = 0.811$ ), and conservation lifestyle (3 items, Cronbach's  $\alpha = 0.785$ ; Table 3).

In Study 2, PCA analysis with 13 of the 15 items in the scale revealed a 3-factor model that accounted for 62.5% of the total variance. Two items (i.e., talked to others in my community about environmental issues; made my yard more desirable for wildlife) were dropped to improve scale reliability. We labeled the 3 PEB factors social environmentalism (6 items, Cronbach's  $\alpha = 0.829$ ), environmental citizenship (4 items, Cronbach's  $\alpha = 0.808$ ), and conservation lifestyle (3 items, Cronbach's  $\alpha = 0.809$ ; Table 3).

We found that respondents to both studies were more likely to engage in private-sphere PEBs than in public-sphere PEBs. Of the 3 types of PEB, respondents in both studies were most likely to participate in conservation lifestyle behaviors such as recycling or energy/water conservation. Fewer respondents participated in environmental citizenship behaviors such as policy support actions or donations to support environmental protection. Respondents were least likely to have expressed social environmentalism behaviors such as volunteering to improve local wildlife habitat or participating as an active member in a local environmental group.

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<sup>3</sup> Wording of dropped items: Made my yard or my land more desirable for wildlife; Talked to others about the benefits of wildlife recreation activities; Recruited others to participate in wildlife activities.

We anticipate that researchers are likely to observe a similar pattern (i.e., frequent expression of conservation lifestyle behaviors, and less frequent expression of social environmentalism and environmental citizenship behaviors) in a variety of research contexts. Our findings increase confidence that conservation lifestyle, social environmental and environmental citizenship are distinct facets of pro-environmental behavior that should be independently considered and assessed.

Larson et al. (2015) found 4 PEB factors. Our analysis using similar items identified 3 PEB factors. We did not include the Larson et al. (2015) items on land stewardship, replacing them with other stewardship items (e.g., volunteering) that we deemed more appropriate for the specific context near Rocky Point NRMA. Thus, it was logical that those new items loaded onto the social environmentalism factor instead of as a separate stewardship factor. Nevertheless, the concept of land stewardship, or deliberate actions taken to improve the environmental quality in a particular locale, would be worthwhile to consider in future research.

### **Potential Mediators of Pro-environmental Behavior (Concern, Norms, Efficacy)**

In both studies, PCA with all 6 items in the potential mediators scale revealed a 3-factor model. We labeled the 3 factors environmental concern (2 items), social norms regarding pro-environmental behavior (2 items), and self-efficacy (2 items) (Table 4). The 3-factor model accounted for 80.8% of the total variance in Study 1 and 87.0% of the total variance in Study 2. Cronbach's  $\alpha$  was higher for the self-efficacy factor in Study 2 (0.845 vs. 0.667). We attribute the improvement to the change in wording for one of the items that was originally reverse-coded (i.e., wording changed from "there is not much I can personally do to help" to "there are things I can do to help").

Respondents in Study 2 were more likely than respondents in Study 1 to agree or strongly agree that the natural environment in their area is threatened by human activity and is suffering ecological damage, possibly because the study was conducted in a more urban area. Most respondents in both studies agreed or strongly agreed that their actions can make a difference when it comes to preserving the local environment. Relatively few respondents believed that people in their community were engaging in activities to protect the local natural environment (Table 4).

### **Community Involvement**

Community involvement was not assessed in Study 1. In Study 2, PCA yielded a 2-factor model that accounted for 72.5% of the total variance in the community involvement scale. We labeled the factors strength of social networks (5 items, Cronbach's  $\alpha = 0.884$ ) and social commitment (2 items, Cronbach's  $\alpha = 0.763$ ; Table 5).

A majority of respondents believed that participating in nature-based activities in Suffolk County led to stronger personal social networks and increased enthusiasm for community involvement. Most respondents agreed that participating in nature-based activities in Suffolk County increased their interest in taking actions (or commitment) to protect water quality and open space.

## Community Resilience

Community resilience was not assessed in Study 1. In Study 2, PCA yielded a 2-factor model that accounted for 68.5% of the total variance in the community resilience scale. Three items which did not load well onto either factor (i.e., I can trust my neighbors, My community has a lot of control over its future, I'd like to be more involved in my community) were dropped to improve scale reliability. We labeled the factors perceived community cohesion (4 items, Cronbach's  $\alpha = 0.823$ ) and perceived community capacity to respond to change (4 items, Cronbach's  $\alpha = 0.816$ ; Table 6).

In general, respondents acknowledged the existence of different values in their communities but believed they got along well with neighbors, leading to higher levels of acceptance and social cohesion. Respondents were less sure about their community's capacity to adapt or respond to change, and many expressed some concern about the future and people's ability to work together to solve local problems.

## CONCLUSIONS

In this report, we used the results from 2 studies to develop recommendations regarding the creation of scales that measure key constructs in our hypothesized Conservation-Recreation Model (Larson et al., 2014). Based on our analyses, the scales and items described above appear to represent valid and reliable instruments for assessing variables such as:

- Place meanings (environmental and sociocultural)
- Place attachment
- Pro-environmental behavior (conservation lifestyle behaviors, environmental citizenship, social environmentalism)
- Potential mediators of pro-environmental behavior (environmental concern, norms, and efficacy)
- Community involvement (social networks, social commitment)
- Community resilience (community cohesion, community capacity)

Future research could use these scales (or adapted versions of these scales) to explore relationships between key constructs in the Conservation-Recreation Model. For example, Cooper et al. (2015) have already employed some of the metrics to compare and contrast the pro-environmental behavioral participation rates for different types of recreationists in New York (specifically, hunters and birders). Larson et al. (2017) have adopted a similar approach, exploring connections between different types of beach recreation and environmental stewardship actions in coastal North Carolina. Other research has also illuminated the broader links between green space, outdoor recreation, and nature-based health promotion (Hartig et al. 2014; Jennings, Yun & Larson, 2016), which can lead to positive conservation outcomes. More studies are needed to understand if, to what extent, and how different types of recreation foster sense of place and ultimately affect outcomes such as community involvement and community resilience. We can use scales such as those developed and described in this report to advance these research objectives and answer important questions about the complex role that nature-based recreation plays in the evolution of healthy, sustainable, and resilient communities and social-ecological systems.

**Table 1. Place Meanings:** Factor loadings (A, B) based on principal component analysis with Varimax rotation for items used to evaluate recreationists’ environmental place meanings and sociocultural place meanings.

	Study 1					Study 2				
	mean <sup>a</sup>	SD	% Agree/ SA	Loadings		mean <sup>a</sup>	SD	% Agree/ SA	Loadings	
				A	B				A	B
<b>A. Environmental place meanings</b> (My local area...)	4.23	0.58		(alpha=0.839)		4.13	0.67		(alpha=0.867)	
is beautiful and scenic	4.49	0.66	94.5	<b>0.807</b>	0.093	4.20	0.79	85.7	<b>.850</b>	.172
feels like home	4.40	0.71	92.3	<b>0.722</b>	0.269	4.23	0.73	89.7	<b>.721</b>	.362
has a high quality <sup>b</sup> natural environment	4.16	0.77	83.8	<b>0.789</b>	0.221	4.16	0.82	83.3	<b>.853</b>	.186
has abundant wildlife	4.16	0.82	84.7	<b>0.680</b>	0.097	3.87	0.93	70.8	<b>.721</b>	.248
provides opportunities for enjoyment of outdoor nature-based activities	4.10	0.83	81.6	<b>0.607</b>	0.296	4.16	0.85	86.3	<b>.704</b>	.298
<b>B. Sociocultural place meanings</b> (My local area...)	3.59	0.78		(alpha=0.816)		3.70	0.74		(alpha=0.813)	
has many of my family and/or friends	3.61	1.06	61.8	0.099	<b>0.794</b>	3.90	0.90	72.7	.228	<b>.780</b>
is a close-knit and “neighborly” community	3.55	0.95	53.5	0.220	<b>0.779</b>	3.46	0.91	48.2	.252	<b>.838</b>
has many people whose company I enjoy	3.59	0.92	54.1	0.245	<b>0.797</b>	3.75	0.80	64.5	.263	<b>.833</b>
Has many people who share my values	3.60	0.93	55.3	0.283	<b>0.728</b>	NA	NA	NA	NA	NA

<sup>a</sup> 1=strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

<sup>b</sup> In Study 2, the words “high quality natural environment” were replaced with “unique natural environment.”

**Table 2. Place Attachment:** Factor loadings (A) based on principal component analysis with Varimax rotation for items used to evaluate recreationists' place attachment meanings.

	Study 1				Study 2			
	mean <sup>a</sup>	SD	Agree/ SA	Loadings A	mean <sup>a</sup>	SD	Agree/ SA	Loadings A
<b>A. Place attachment meanings</b>								
(Regarding your local area...)	3.88	0.75		(alpha=0.939)	3.51	0.854		(alpha=0.939)
I am very attached to it	3.94	0.90	71.5	<b>0.865</b>	3.95	0.900	74.3	<b>0.834</b>
I would not substitute any other place for it	3.56	1.07	51.9	<b>0.833</b>	3.17	1.127	38.4	<b>0.871</b>
It says a lot about who I am	3.82	0.93	65.0	<b>0.847</b>	3.45	0.998	49.2	<b>0.856</b>
It is the best place for doing the things that I enjoy most	3.73	0.98	60.7	<b>0.847</b>	3.35	1.058	46.1	<b>0.853</b>
I really miss it when I am away too long	3.87	0.93	67.0	<b>0.845</b>	3.53	0.984	55.4	<b>0.867</b>
I feel happiest when I am here	3.88	0.90	67.2	<b>0.858</b>	3.50	0.949	50.1	<b>0.889</b>
I have a special connection to this place and the people in the area	3.85	0.93	67.6	<b>0.779</b>	3.65	0.944	60.4	<b>0.827</b>
It means a lot to me	4.30	0.73	86.7	<b>0.761</b>	NA	NA	NA	NA
I feel that I can really be myself here	4.02	0.79	77.6	<b>0.747</b>	NA	NA	NA	NA

<sup>a</sup> 1=strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

**Table 3. Pro-environmental Behavior:** Factor loadings (A, B, and C) based on principal component analysis with Varimax rotation for items used to evaluate recreationists' adoption of pro-environmental behavior.

	Study 1						Study 2					
	mean <sup>a</sup>	SD	Often/ VO	Loadings			mean <sup>a</sup>	SD	Often/V O	Loadings		
				A	B	C				A	B	C
<b>A. Social environmentalism</b>	2.33	0.87		(alpha=0.840)			1.92	0.75		(alpha=0.829)		
Worked with others to address an environ.. issue or problem	2.40	1.03	12.0	0.290	<b>0.754</b>	0.021	2.49	1.03	13.2	<b>.637</b>	.448	.123
Participated as an active member in a local environ. group	1.89	1.08	9.2	0.371	<b>0.740</b>	0.006	2.12	1.10	11.2	<b>.678</b>	.432	.090
Participated in a wildlife (alt: citizen science) study	2.39	1.27	19.9	0.188	<b>0.628</b>	0.114	1.61	0.98	6.3	<b>.704</b>	.226	-.010
Volunteered to improve wildlife habitat in my community	2.12	1.15	13.3	0.154	<b>0.801</b>	0.102	2.18	1.15	13.7	<b>.722</b>	.326	.081
Talked to others in my community about environ. issues	2.79	1.16	27.9	0.424	<b>0.561</b>	0.171	NA	NA	NA	NA	NA	NA
Volunteered to maintain local hiking, biking, or horse riding trails	NA	NA	NA	NA	NA	NA	1.95	1.17	11.3	<b>.690</b>	.120	.084
Volunteered my time at Wertheim NWR	NA	NA	NA	NA	NA	NA	1.19	0.61	1.8	<b>.656</b>	.003	-.078



**Table 3.** (continued).

	Study 1						Study 2					
	mean <sup>a</sup>	SD	Loadings			mean <sup>a</sup>	SD	Loadings				
			Often/ VO	A	B			C	Often/ VO	A	B	C
<b>B. Environmental citizenship</b>	2.34	1.00	(alpha=0.811)			2.67	0.94	(alpha=0.808)				
Voted to support a policy or reg. that affects the local environment	2.70	1.29	28.3	<b>0.766</b>	0.236	0.165	3.18	1.31	44.3	.092	<b>.789</b>	.170
Signed a petition about an environmental issue	2.48	1.23	19.4	<b>0.830</b>	0.232	0.069	2.75	1.14	24.6	.193	<b>.826</b>	.125
Donated money to support local environ. protection	2.44	1.20	19.8	<b>0.691</b>	0.312	0.158	2.74	1.14	24.3	.362	<b>.622</b>	.176
Wrote a letter in response to an environmental issue	1.93	1.11	9.8	<b>0.760</b>	0.324	0.084	1.98	1.10	10.5	.312	<b>.741</b>	-.044
<b>C. Conservation lifestyle</b>	4.41	0.63	(alpha=0.785)			4.47	0.67	(alpha=0.809)				
Recycled paper, plastic, and metal	4.62	0.67	93.9	0.154	0.122	<b>0.821</b>	4.63	0.77	91.2	-.022	.077	<b>.785</b>
Conserved water or energy in my home	4.40	0.76	88.8	0.084	0.039	<b>0.774</b>	4.47	0.77	88.8	.051	.070	<b>.887</b>
Bought environ.-friendly and/or energy-efficient products	4.23	0.83	81.0	0.100	0.089	<b>0.881</b>	4.34	0.82	84.3	.081	.165	<b>.832</b>

<sup>a</sup> Scale: 1=never, 2=rarely, 3=sometimes, 4=often, 5=very often

**Table 4. Potential Mediators of Pro-environmental Behavior:** Factor loadings (A, B, C) based on principal component analysis with Varimax rotation for items used to evaluate recreationists' environmental concerns, social norms, and self-efficacy.

	Study 1						Study 2					
	mean <sup>a</sup>	SD	Agree/ SA	A	B	C	mean <sup>a</sup>	SD	Agree/ SA	A	B	C
<b>Environmental concern</b> (The natural environment in my area)	3.25	0.87		(alpha=0.742)			3.84	.957		(alpha=0.876)		
Is threatened by human activities	3.49	1.02	53.3	<b>0.887</b>	0.017	0.087	3.88	1.03	71.5	<b>0.941</b>	0.080	-0.070
Is currently suffering ecological damage	3.02	0.93	28.1	<b>0.878</b>	-0.039	-0.133	3.80	.991	66.0	<b>0.928</b>	0.133	-0.109
<b>Social norms about pro-environmental behavior</b> (Most people in my community)	3.31	0.85		(alpha=0.829)			3.32	.946		(alpha=0.827)		
Think it is important to protect the natural environment (alt:... in Suffolk County)	3.47	0.94	54.4	-0.134	<b>0.910</b>	0.033	3.60	1.00	59.9	-0.076	0.088	<b>0.917</b>
Engage in activities that help protect the natural environment (alt:... in Suffolk County)	3.13	0.90	32.3	-0.096	<b>0.913</b>	0.088	3.05	1.04	33.3	-0.098	0.111	<b>0.910</b>
<b>Self-efficacy</b> (When it comes to preserving local environmental quality)	3.70	0.76		(alpha=0.667)			4.05	.700		(alpha=0.845)		
My actions can make a difference	3.55	0.93	74.0	0.100	0.184	<b>0.854</b>	4.05	.770	83.5	0.114	<b>0.912</b>	0.129
There is not much I can personally do to help <sup>b</sup>	3.87	0.77	57.9	-0.118	-0.057	<b>0.881</b>	4.06	.734	84.1	0.096	<b>0.924</b>	0.074

<sup>a</sup> 1=strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

<sup>b</sup> Reverse coded; In Study 2, wording changed to, "there are things I can do to help."

**Table 5. Community Involvement:** Factor loadings (A, B) based on principal component analysis with Varimax rotation for items used to evaluate recreationists' strength of social networks and social commitment (Study 2 only).

	Study 2				
	mean <sup>a</sup>	SD	Agree/ SA	Loadings	
				A	B
<b>A. Social networks</b> (alpha=0.884)	3.66	0.77			
Participating in nature-based, outdoor activities in Suffolk Co. has					
Introduced me to new people in my community	3.66	0.96	59.9	<b>.830</b>	.133
Strengthened my relationship with people in the local community	3.56	0.93	51.6	<b>.877</b>	.134
Made me feel more connected to my local community	3.76	0.94	65.4	<b>.820</b>	.237
Made me more interested in getting involved in my local community	3.64	0.91	56.6	<b>.812</b>	.267
Increased my interest in joining local recreation clubs	3.68	0.97	58.7	<b>.664</b>	.267
<b>B. Social commitment</b> (alpha=0.763)	4.28	0.70			
Participating in nature-based, outdoor activities in Suffolk Co. has					
Increased my interest in taking actions to protect water quality in Suffolk Co.	4.01	0.83	78.6	.244	<b>.860</b>
Increased my interest in protecting open space in Suffolk co.	4.47	0.72	91.1	.182	<b>.884</b>

<sup>a</sup> 1=strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

**Table 6. Community Resilience:** Factor loadings (A, B) based on principal component analysis with Varimax rotation for items used to evaluate recreationists' perceived community cohesion and perceived community capacity to respond to change (Study 2 only).

	Study 2				
	mean <sup>a</sup>	SD	Agree/ SA	Loadings	
				A	B
<b>Community Cohesion</b> (alpha=0.823)	3.74	0.630			
I feel that I am accepted by people in my community	3.83	0.754	70.9	.170	<b>.864</b>
I get along well with other people in my community	4.03	0.656	82.4	.097	<b>.886</b>
I can trust my neighbors	3.76	0.841	68.8	.314	<b>.708</b>
People here share my basic values	3.35	0.851	45.7	.526	<b>.596</b>
<b>Community Capacity (to respond to change)</b> (alpha=0.816)	3.27	0.648			
People here work together to solve local problems	3.15	0.817	31.7	<b>.712</b>	.361
My community can adapt to change	3.33	0.767	42.9	<b>.858</b>	.206
My community can respond to change	3.44	0.699	49.1	<b>.853</b>	.171
My community has control over its future	3.13	.932	32.9	<b>.699</b>	.113

<sup>a</sup> 1=strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

## LITERATURE CITED

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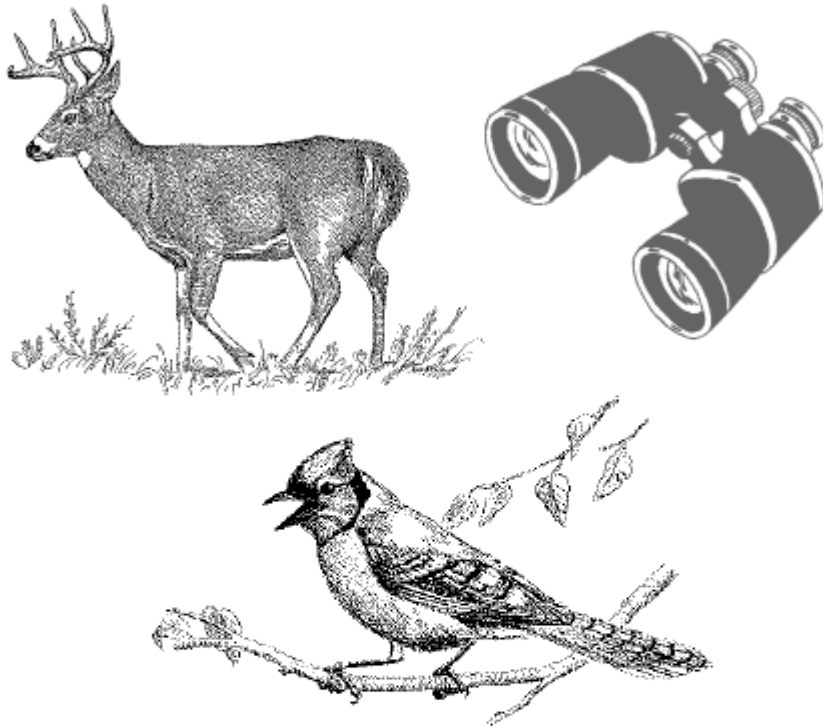


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# Wildlife-Based Recreation & Your Local Area



A Study Conducted by:



Cornell University  
Human Dimensions Research Unit

In Association With:

The **Cornell** Lab  of Ornithology

## **Wildlife-Based Recreation & Your Local Area**

The Department of Natural Resources at Cornell University has a long history of interest in the health and prosperity of New York's rural residents, their communities, and the natural resources of the state. Our research and extension education programs are designed to help rural families, community leaders, and government officials maintain the quality of the environment that they value. Reaching out to rural residents with surveys like this enables us to learn what is important to you.

We are interested in learning about your participation in outdoor activities involving wildlife and the connection you feel with your local area. The information we gather from all people we are surveying will inform land and wildlife management efforts and help ensure quality of life in rural communities across upstate New York.

Please complete this questionnaire as soon as you can, seal it with the white re-sealable label provided, and drop it in any mailbox; return postage has been paid. Your participation in this study is voluntary, but we sincerely hope you will take a few minutes to answer our questions. Your identity will be kept confidential and the information you give us will never be associated with your name.

**THANK YOU FOR YOUR HELP!**

**SECTION 1. Recreation Participation**

**1. Which of these outdoor recreation activities did you participate in as a child (age 15 or younger)? (Check ALL that apply.)**

- I **DID NOT** participate in outdoor activities as a child
- Bird watching
- Hunting
- Fishing
- Other types of nature-based recreation (hiking, camping, etc.)

**2. In the last 12 months, about how many days did you spend some time participating in the following outdoor recreation activities? (Write the approximate number of days participating in the space provided. If you did not participate in the activity, write "0".)**

Activity	# of Days Participating
Bird watching	
Hunting	
Fishing	
Other types of nature-based recreation (hiking, camping, canoeing, etc.)	
Other: _____	

**3. In the last 12 months, how many of your nature-based recreation activities occurred within a 30-minute drive of your home? (Check ONE response.)**

- More than half       About half       Less than half
- I **DID NOT** participate in nature-based recreation

**4. Which of the following activities related to bird watching have you participated in during the last 12 months? (Check ALL that apply.)**

- I **DID NOT** participate in bird watching
- Maintained a bird feeder or nest box
- Watched birds around your home
- Traveled within a 30-minute drive of your home to watch birds
- Took overnight trips with the primary purpose of bird watching
- Participated in organized bird monitoring

5. Which of the following types of hunting have you participated in during the last 12 months?

*(Check ALL that apply.)*

- I DID NOT participate in hunting
- Big game – archery
- Big game – firearm (shotgun, rifle or muzzleloader)
- Turkey
- Waterfowl
- Upland game birds (grouse, pheasant, etc.)
- Small game mammals (rabbit, squirrel, etc.)
- Furbearers (coyote, fox, raccoon, etc.)

**SECTION 2. Factors Influencing Recreation Participation**

For questions 6-13, if you bird watch and/or hunt then select the one that you enjoy the most and answer the following questions with **THAT** particular activity in mind. If you do not bird watch or hunt, answer questions 6-13 with another favorite nature-based recreation activity in mind. *(If you DO NOT participate in any outdoor recreation activities, skip to Question 14.)*

6. Please indicate the **ONE** activity that you will keep in mind as your respond to the following questions? *(Check only ONE response.)*

- Bird watching
- Hunting
- Other activity (please specify): \_\_\_\_\_

7. Approximately how many years have you been participating in **THIS** activity?

\_\_\_\_\_ years participating

8. How many clubs or organizations related to **THIS** activity do you belong to? *(Write total number of club memberships in space below.)*

\_\_\_\_\_ total clubs or organizations

*(examples include local birding or hunting clubs and national organizations such as Audubon and Ducks Unlimited)*

**9. How important are the following individuals and organizations to your continued participation in THIS activity?**

*(Circle ONE number for each item.)*

	Not at all important	Slightly important	Moderately important	Important	Extremely important
Family	1	2	3	4	5
Friends	1	2	3	4	5
The local community	1	2	3	4	5
Organized groups and clubs	1	2	3	4	5
Government agencies	1	2	3	4	5

**10. How important are the following factors in your decision to participate in THIS activity? (Circle ONE number for each item.)**

	Not at all important	Slightly important	Moderately important	Important	Extremely important
Build friendships with other wildlife recreationists	1	2	3	4	5
Learn about wildlife and nature	1	2	3	4	5
Help others develop outdoor skills and knowledge	1	2	3	4	5
Improve my skills and knowledge	1	2	3	4	5
Assist with wildlife management efforts	1	2	3	4	5
Get outdoors and enjoy nature	1	2	3	4	5
Contribute to wildlife conservation	1	2	3	4	5
Challenge my skills and abilities	1	2	3	4	5
Escape from everyday problems	1	2	3	4	5
Meet people who share my interests	1	2	3	4	5



11. Please indicate to what extent you disagree or agree with the following statements about **THIS** activity.

(Circle ONE number for each item.)

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
I would rather participate in this activity than do most anything else.	1	2	3	4	5
I have invested a lot of money in gear and equipment related to this activity.	1	2	3	4	5

12. Thinking about the total time you spent participating in **THIS** activity during the last 12 months, what percentage of that total time did you spend in the following kinds of places?

(Write % in the space below. Responses should add up to 100%.)

Activity Location	% of Total Time
Land that YOU OWN <u>within</u> a 30-minute drive of your primary residence	
<u>PRIVATE</u> land that you <u>do not own within</u> a 30-minute drive of your home	
<u>PRIVATE</u> land (including your own) <u>more than</u> 30 minutes from your home	
<u>PUBLIC</u> land <u>within</u> a 30-minute drive of your home	
<u>PUBLIC</u> land <u>more than</u> 30 minutes from your home	

13. How satisfied are you with the following aspects of **THIS** activity in your local area? (Circle ONE number for each item.)

	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Access to <u>PRIVATE</u> land ( <u>not</u> including your own) where the activity can occur	1	2	3	4	5
Access to <u>PUBLIC</u> land where the activity can occur	1	2	3	4	5
Quality of recreation opportunities on <u>PRIVATE</u> lands (including your own)	1	2	3	4	5
Quality of recreation opportunities on <u>PUBLIC</u> lands	1	2	3	4	5

**SECTION 3. Connection to Your Local Area**

**14. Please indicate to what extent you disagree or agree with the following statements about your local area.**  
*(Circle ONE number for each item.)*

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<b>My local area...</b>					
Is beautiful and scenic	1	2	3	4	5
Feels like home	1	2	3	4	5
Has many people who share my values	1	2	3	4	5
Has abundant wildlife	1	2	3	4	5
Has many people whose company I enjoy	1	2	3	4	5
Is peaceful	1	2	3	4	5
Has a high-quality natural environment	1	2	3	4	5
Is a close-knit and “neighborly” community	1	2	3	4	5
Has many of my family and/or friends	1	2	3	4	5
Provides opportunities for enjoyment of outdoor nature-based activities	1	2	3	4	5

**15. Please indicate to what extent you disagree or agree with the following statements about your local area.**  
*(Circle ONE number for each item.)*

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<b>Regarding your local area:</b>					
It means a lot to me.	1	2	3	4	5
I would not substitute any other place for it.	1	2	3	4	5
It says a lot about who I am.	1	2	3	4	5
It is the best place for doing the things that I enjoy most.	1	2	3	4	5
I really miss it when I am away too long.	1	2	3	4	5

<u>Question 15 continued:</u>	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<b>Regarding your local area:</b>					
I feel happiest when I am here.	1	2	3	4	5
There are better places to be than here	1	2	3	4	5
I feel that I can really be myself here.	1	2	3	4	5
I am very attached to it.	1	2	3	4	5
I have a special connection to this place and the people in the area.	1	2	3	4	5

**16. All things considered, how satisfied are you with the current quality of life in your local area? (Check ONE response.)**

- Very dissatisfied
- Dissatisfied
- Neither dissatisfied nor satisfied
- Satisfied
- Very satisfied

**17. Please indicate to what extent you disagree or agree with the following statements about the natural environment in your local area. (Circle ONE number for each item.)**

<b>The natural environment in my local area...</b>	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Is in good shape	1	2	3	4	5
Has improved over the last few years	1	2	3	4	5
Is threatened by human activities	1	2	3	4	5
Is currently suffering ecological damage	1	2	3	4	5

<u>Question 17 continued:</u>	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<b>Most people in my community...</b>					
Think it is important to protect the natural environment	1	2	3	4	5
Engage in activities that help to protect the natural environment	1	2	3	4	5
<b>When it comes to preserving local environmental quality,...</b>					
My actions can make a difference	1	2	3	4	5
There is not much I can personally do to help	1	2	3	4	5

**18. How often have you engaged in the following activities to improve the quality of your local area?**  
*(Circle ONE number for each item.)*

	Never	Rarely	Sometimes	Often	Very often
Worked with others to address an environmental problem or issue	1	2	3	4	5
Participated as an active member in a local environmental group	1	2	3	4	5
Signed a petition about an environmental issue	1	2	3	4	5
Wrote a letter in a response to an environmental issue	1	2	3	4	5
Voted to support a policy or regulation that affects the local environment	1	2	3	4	5
Donated money to support local environmental protection	1	2	3	4	5
Talked to others in my community about environmental issues	1	2	3	4	5
Made my yard or my land more desirable for wildlife	1	2	3	4	5
Volunteered to improve wildlife habitat in my community	1	2	3	4	5
Participated (provided data) in a wildlife study	1	2	3	4	5

<u>Question 18 continued:</u>	Never	Rarely	Sometimes	Often	Very often
Talked to others about the benefits of wildlife recreation activities	1	2	3	4	5
Recruited others to participate in wildlife recreation activities	1	2	3	4	5
Recycled paper, plastic, and metal	1	2	3	4	5
Conserved water or energy in my home	1	2	3	4	5
Bought environmentally friendly and/or energy-efficient products	1	2	3	4	5

**19. In general, how would you describe your level of involvement in your community, including all of the local activities or events (environmental and non-environmental) you participate in? (Check ONE response.)**

- Not involved
- Slightly involved
- Moderately involved
- Involved
- Extremely involved

**20. Please indicate to what extent you disagree or agree with the following statements regarding the people in your local area. (Circle ONE number for each item.)**

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I feel that I am accepted by people in my community.	1	2	3	4	5
I get along well with other people in my community.	1	2	3	4	5
Members of my community work together to resolve local issues.	1	2	3	4	5

**SECTION 4. Background Information**

21. I am a (*Check ONE.*)...     Female     Male

22. I was born in (*Write year.*)...    19\_\_\_\_\_

23. How long have you been living in the COUNTY where you currently reside?

\_\_\_\_\_ years

24. Which of the following best describes your work situation during the last 12 months? (*Check ONE response.*)

- Employed full-time                       Student
- Employed part-time                       Retired
- Not employed

25. What is the highest level of education you have completed? (*Check ONE response.*)

- Some high school
- High school diploma / G.E.D.
- Some college or technical school
- Associate's or Bachelor's college degree (B.A., B.S., etc.)
- Graduate or professional degree (M.S., Ph.D., M.D., J.D., etc.)

26. How would you describe your political views?

(*Indicate position by checking the appropriate box on the scale below.*)

Liberal		Moderate		Conservative
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Thank you for your time and effort!**

To return this questionnaire, simply seal it with the white removable seal and drop it in the mail (return postage has been paid).

**APPENDIX B: SURVEY INSTRUMENT USED IN STUDY 2**

[INTRODUCTORY SCREEN FOR WEB-BASED SURVEY INSTRUMENT]

# **Nature-Based Recreation in Suffolk County**

Research conducted by the  
Human Dimensions Research Unit  
Department of Natural Resources, Cornell University

In cooperation with the

NYS Department of Environmental Conservation (DEC)  
Division of Fish, Wildlife & Marine Resources

The Department of Natural Resources at Cornell University is collaborating with the New York State Department of Environmental Conservation to characterize outdoor, nature-based recreational activities in Suffolk County. By participating in this survey, you can help DEC better understand the value of public lands, like Rocky Point Natural Resource Management Area, in providing places for nature-based recreation in Suffolk County.

Your participation in this study is voluntary, but we sincerely hope you will take a few minutes to answer our questions. Your identity will be kept confidential and the information you give us will never be associated with your name.

**THANK YOU FOR YOUR HELP!**

**CONTINUE →**

**SECTION 1: YOUR RECREATION ACTIVITIES**

**1. Which of these outdoor, nature-based recreation activities did you participate in within Suffolk County, in the last 12 months? (Check ALL that apply.)**

- I DID NOT participate in outdoor activities in Suffolk County in the last 12 months
- Hiking
- Mountain biking
- Fishing
- Hunting
- Canoeing or kayaking
- Horseback riding
- Bird watching
- Other types of outdoor nature-based recreation  
(Please specify types):\_\_\_\_\_

**2. In the last 12 months, about how many days did you spend some time participating in the following outdoor recreation activities? (Write the approximate number of days participating in the space provided. If you did not participate in the activity, write "0".)**

Activity	Total # of days spent in Suffolk County	# of days spent at Rocky Point NRMA
Hiking	_____ days	_____ days
Mountain biking	_____ days	_____ days
Fishing	_____ days	_____ days
Hunting	_____ days	_____ days
Canoeing or kayaking	_____ days	_____ days
Horseback riding	_____ days	_____ days
Bird watching	_____ days	_____ days
Other types of nature-based recreation (Please specify):_____	_____ days	_____ days



3. Thinking about the total time you spent participating in nature-based activities during the last 12 months, what percentage of that total time did you spend in the following kinds of places? (Write % in the space below. Responses should add up to 100%.)

Activity location	% of total time
PRIVATE land <u>within</u> Suffolk County	_____ %
PRIVATE land outside Suffolk County	_____ %
PUBLIC land <u>within</u> Suffolk County	_____ %
PUBLIC land outside Suffolk County	_____ %
Total:	100 %

## PART 2: CONNECTION TO YOUR LOCAL AREA

4. Please indicate whether you disagree or agree that participating in nature-based recreation in Suffolk County has affected you in any of the following ways. (Check ONE response per row.)

<i>Participating in nature-based, outdoor activities in Suffolk County has:</i>	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
introduced me to new people in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
strengthened my relationships with people in the local community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
made me feel more connected to my local community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
made me more interested in getting involved in my local community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased my interest in joining local recreation clubs (e.g., mountain biking, hiking, or hunting club)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased my interest in taking actions to protect water quality in Suffolk County for future generations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased my interest in protecting open space in Suffolk County	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**5. Please indicate to what extent you disagree or agree with the following statements about your local area (Check ONE response per line.)**

<b>My local area ...</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>
is beautiful and scenic.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
feels like home.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
has a unique natural environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
has abundant wildlife.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
provides opportunities for enjoyment of outdoor nature-based activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
has many of my family and/or friends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
is a close-knit and “neighborly” community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
has many people whose company I enjoy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**6. Please indicate to what extent you disagree or agree with the following statements about your local area. (Check ONE response per line.)**

<b>Regarding your local area ...</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>
I am very attached to it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would not substitute any other place for it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It says a lot about who I am.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is the best place for doing the things that I enjoy most.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I really miss it when I am away too long.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel happiest when I am here.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a special connection to this place and the people in the area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**7. Please indicate to what extent you disagree or agree with the following statements.**  
*(Check ONE response per line.)*

<b>The natural environment in my local area ...</b>	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
is threatened by human activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
is currently suffering ecological damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Most people in my community...</b>	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
think it is important to protect the natural environment in Suffolk County.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
engage in activities that help protect the natural environment in Suffolk County.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>When it comes to preserving local environmental quality ...</b>	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
my actions can make a difference.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
there are things I can personally do to help.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**8. How often have you engaged in the following activities to improve the quality of your local area? (Check ONE response per line.)**

	Never	Rarely	Sometimes	Often	Very often
Worked with others to address an environmental problem or issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Participated as an active member in a local environmental group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Signed a petition about an environmental issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wrote a letter in response to an environmental issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voted to support a policy or regulation that affects the local environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Donated money to support local environmental protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Talked to others in my community about environmental issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Made my yard or my land more desirable for wildlife	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Volunteered to improve wildlife habitat in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Participated in a citizen science project (e.g., provided data for a Christmas bird count or a local water quality study)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Volunteered to maintain local hiking, biking, or horse riding trails	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Volunteered my time at Wertheim National Wildlife Refuge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recycled paper, plastic, and metal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conserved energy and/or water in my home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bought environmentally-friendly and/or energy-efficient products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**9. In general, how would you describe your level of involvement in your community, including all of the local activities or events (environmental and nonenvironmental) you participate in? (Check ONE response.)**

- Not involved
- Slightly involved
- Moderately involved
- Very involved
- Extremely involved

*(Index of perceived general capacity of my community to respond to change)*

**10. Please indicate your level of agreement with the following statements regarding your local community. (Check ONE response per line.)**

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I feel that I am accepted by people in my community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I get along well with other people in my community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can trust my neighbors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My community has a lot of control over its future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People here share my basic values.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People here work together to solve local problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My community can adapt to change.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My community can respond to change.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I'd like to be more involved in my community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### **PART 3: BACKGROUND INFORMATION**

(Please remember that all your responses are confidential)

**11. Are you . . . . ?**

- Male
- Female

**12. In what year were you born? (Fill in the blank.)**

19\_\_\_\_\_

**13. How long have you been living in the COUNTY where you currently reside? (Fill in the blank.)**

\_\_\_\_\_ years

**14. What is the highest level of education you have completed? (Check ONE response.)**

- Some high school
- High school diploma / G.E.D.
- Some college or technical school
- Associate's or Bachelor's college degree  
(B.A., B.S., etc.)
- Graduate or professional degree  
(M.S., Ph.D., M.D., J. D., etc.)

***THANK YOU FOR YOUR PARTICIPATION!***