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Natural Resource Stewardship and Science

Informing Plans for Managing Resources of Cape Lookout National Seashore under Projected Climate Change, Sea Level Rise, and Associated Impacts

Stakeholder Studies Synthesis Report

Natural Resource Report NPS/CALO/NRR—2019/1863

ON THIS PAGE
A view of Cape Look National Seashore from inside a historic structure on the site.
Image credit: Sandra Fatorić

ON THE COVER
Historic structure and local flora at Cape Lookout National Seashore.
Image credit: Erin Seekamp

Informing Plans for Managing Resources of Cape Lookout National Seashore under Projected Climate Change, Sea Level Rise, and Associated Impacts

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Natural Resource Report NPS/CALO/NRR—2019/1863

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Executive Summary

Climate change impacts, such as increased storm-related flooding and sea level rise, are challenging traditional approaches to cultural resource management. Managers must consider not only the significance, integrity, and association when considering preservation strategies but also the resilience of materials and constraints of the landscape, as well as the budget limitations that inhibit managers from adapting all resources at once. Current U.S. Department of Interior, National Park Service (NPS) policy guidelines (2014) recommend that managers prioritize the most vulnerable and most significant cultural resources for adaptation. Yet, adaptation strategies that reduce the vulnerability of cultural resources may alter the socio-cultural values various stakeholder groups place on those resources.

This report synthesizes select findings from four separate stakeholder studies aimed at documenting preferences for adapting cultural resources at Cape Lookout National Seashore. The four stakeholder studies included: (1) on-site structured interviews with park visitors, (2) interviews with community members[1], (3) online survey questionnaires with members of Cape Lookout National Seashore partner organizations, and (4) an online survey with cultural resource management and historic preservation experts. All study participants were asked to consider their responses in relation to the historic buildings located within two villages listed on the National Register of Historic Places: Cape Lookout Village and Portsmouth Village. This report compares findings from each of these groups in three main areas of: (a) place connections and cultural resource values, (b) adaptation strategies, and (c) preservation priorities.

Place connections can be tangible (e.g., the best place for shelling or fishing) and/or intangible (e.g., a part of one's identity) values that connect individuals to a geographic space (Davenport & Anderson, 2005). Our findings highlight that visitors, community members, and members of partner organizations value the Cape Lookout in terms of its uniqueness and importance to national heritage and future generations. Community members had the strongest place connections which were largely intangible values connected to heritage and family and individual identity. Members of CALO partner organizations (e.g., Friends of Portsmouth Island) had moderate place connections, while visitors held the weakest place connections.

[1] The study population consisted of individuals or descendants of individuals who owned or leased a building within one of the two historic districts at CALO (i.e., Portsmouth Village and Cape Lookout Village). An initial list of these individuals was provided by the Park Superintendent and the Director of the Core Sound Waterfowl Museum and Heritage Center (a partner organization). We expanded our sample to other community members using chain-referral sampling, i.e., individuals identified by those on our original list who we were told also have strong connections to one or more of the historic districts.

Each group somewhat differed in their preferences for adaptation strategies[2]. There was a general preference to "interpret the change" and "leave things as they are" using annual maintenance, which was particularly characteristic of community members' preferences as they typically felt moving or elevating buildings would detract from their place connections. Visitors preferred elevating buildings and members of partner organizations preferred that changes be managed (e.g., planting vegetation to reduce erosion or building boardwalks to access buildings) or that resilience be improved (e.g., alter or modify building to withstand storm surge and flooding, including elevating). Experts most commonly recommended that managers "improve resilience" or "document and release" structures (i.e., study and record the details of the building, and then allow them to deteriorate with storms and flooding) as adaptation strategies.

Visitors, members of partner organizations, and experts commonly felt that national importance was a key criterion for prioritizing buildings for adaptation. Visitors most favored preserving the Cape Lookout Lighthouse and Keeper's Quarters, and experts reported that buildings which play a central role in the cultural landscape should be prioritized. Additionally, members of partner organizations and experts are keen to see prioritization based on buildings' scientific value. Members of partner organizations also felt the meaningfulness to a community of people was as important as national significance in terms of adaptation prioritization. Although community members were not asked about preservation priorities, their place connections align with preserving structures that are both nationally and locally significant, and they specifically described the Cape Lookout Lighthouse as being a community symbol that represented "home".

Readers of this report should be aware that generalizability of the results and recommendations provided in this report are limited. The stakeholder preferences reported in this document are specific to the sample populations who voluntarily participated in interviews or responded to surveys related to Cape Lookout National Seashore cultural resources. These sample populations of various stakeholders are not representative of all Cape Lookout National Seashore stakeholders—particularly the community member sample, given the qualitative research methodologies employed—and are not representative of cultural resource stakeholders in other locales. While the exact inferences should not be transferred to other contexts, our hope is that this report provides a framework and approach for gathering and synthesizing stakeholder perceptions as part of cultural resource adaptation planning processes.

In summary, these findings demonstrate the utility of considering multiple stakeholder opinions in cultural resource management and climate adaptation. Further, the gestalt of findings—specifically, synthesizing stakeholder opinions rather than considering them in isolation of one another—can enhance the ability of managers to consider the commonalities and differences among stakeholder groups' preferences.

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[2] The original list of adaptation actions in this study were informed by a 2014 NPS workshop report, Preserving Coastal Heritage: Summary Report; available online at http://www.achp.gov/docs/preserve-coastal-heritage.pdf, which has since been updated as part of the NPS Cultural Resource Climate Change Strategy (see: Rockman et al. 2016). Not all stakeholders were provided with a full range of adaptation options & question wording differed for each stakeholder group

The Cape Lookout Lighthouse and Keeper's Quarters (courtesy of E. Seekamp)

Acknowledgments

We would like to thank the individuals who took the time to participate in the various studies and share their insights and expertise for enhancing management in the face of climate change.

Introduction

This report is intended to summarize the similarities and differences between responses from four stakeholder groups examined as part of a climate adaptation study of cultural resources at Cape Lookout National Seashore. The four stakeholder studies included: (1) on-site structured interviews with park visitors, (2) interviews with community members, (3) online survey questionnaires with members of partner organizations, and (4) and online survey questions with cultural resource management and historic preservation experts. All study participants were asked to consider their responses in relation to the historic buildings located within two villages listed on the National Register of Historic Places: Cape Lookout Village and Portsmouth Village.

These diverse voices represent distinct types of knowledge regarding both historic districts at Cape Lookout National Seashore specifically and cultural resource management and climate change adaptation more broadly. This report summarizes stakeholders' responses to items that were somewhat similar across data collection techniques. However, it is important to note that not all groups were asked all of the same questions and, question wording differed within each study. We only make comparative inferences for those topical areas when there was sufficient overlap between two or more groups in regards to the questions they were asked. For full details from each of the stakeholder studies, please consult those specific reports (listed in references).

Report Overview

First, this report presents a summary of the four different studies and their corresponding methodologies. The data collection instruments and sampling approaches varied between each stakeholder study. Our analytical techniques are briefly described.

Next, we present the synthesized results, including a description or profile of each of the stakeholder populations that participated in the various survey methods. Lastly, we discuss the results in terms of implications for research and cultural resources management, noting how the common ground uncovered (shared values and preferences) may serve as a starting point for future adaptation planning efforts.

Background

This report presents findings from a study of Cape Lookout National Seashore. The study was designed to provide information that can assist managers in making preservation decisions about the historic resources located within a cultural landscape. This information is particularly relevant as the resources at Cape Lookout National Seashore are threatened by changing environmental conditions from climate change, such as storm-related flooding and erosion and sea level rise (Peek et al., 2015).

Congress established Cape Lookout National Seashore in 1966 and authorized the National Park Service to manage the natural and cultural resources for public use and enjoyment of its outstanding natural and recreational values. Cape Lookout National Seashore is located along the coastline of North Carolina, and is composed of a system of barrier islands that collectively stretch 56 miles. Barrier islands are dynamic dune, marsh, and beach landscapes, as the sands shift with the wind, tides, and storms. Preservation of these ephemeral ecosystems and physical assets (buildings, docks,

roads) is particularly challenging, as managers cannot stop sea level rise, prevent storms from hitting the coast, or mitigate the natural tendency of the barrier island to migrate toward land due to sea level rise (Riggs, et al., 2011).

Although the islands are currently uninhabited, there are two nationally delegated Historic Districts at the northern (Portsmouth Village) and southern (Cape Lookout Village) ends of the park's boundary (Figure 1). The villages are made up of once occupied homes and buildings that serve as remnants of past maritime life on the islands. In Portsmouth Village, the cultural landscape reflects the community that grew from the establishment of a Life Saving Station in 1894. The historic remains in Portsmouth Village tell the story of island life after 1894 and visitors can enter the Life Saving Station, the Post Office and General Store, the Schoolhouse, the Methodist Church, and four former residences (11 former residences are not open for public visitation). Portsmouth Village was listed on the National Register of Historic Places in 1976.

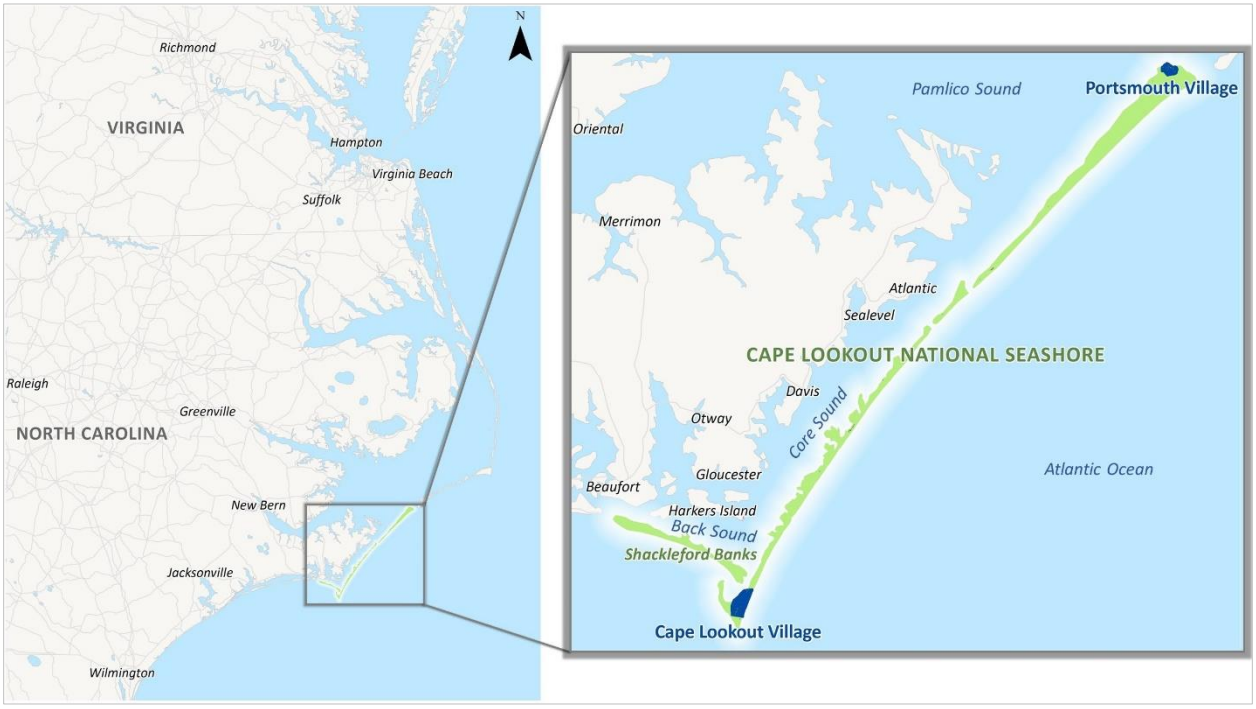

Figure 1. Cape Lookout National Seashore (map created by K. Bitsura-Meszaros, 2017)

Settlement of Cape Lookout Village began with the establishment of the Cape Lookout Light Station in 1859 and, subsequently in an area two miles south of the Lighthouse, with a Live Saving Station in 1887 and a Coast Guard Station in 1916. Residential development followed in the mid-1900s, first as temporary homes for men working for the Coast Guard and their visiting families and later as seasonal fishing camps and second homes. The Cape Lookout Light Station Complex was listed on the National Register of Historic Places in 1972, the Cape Lookout Coast Guard Station Complex in 1988, and these complexes along with 14 of the residential buildings (one of which is a former Life Saving Station) were designated as a historic district in 2000. Visitors can climb the Lighthouse and

enter the adjacent Keeper's Quarters (built in 1873). None of the other buildings are open to the public.

The buildings within each of the historic districts are considered highly vulnerable to climate change impacts by 2100, with the exception of the Coast Guard Station due to its location on higher sand dunes (Peek et al., 2015). Nearly all the buildings in Portsmouth Village have already experienced significant storm-related flooding and many of the buildings in Cape Lookout Village are especially vulnerable to erosion. As the National Park Service is tasked with historic preservation, the agency needs to better understand the perspectives of different stakeholder groups regarding their connections to the historic buildings and the ways in which different management strategies aimed at adapting the buildings to climate change impacts may change their place connections. This report is focused on understanding the experiences and perspectives of four stakeholder groups: visitors to, former community members of, current members of organizations partnering with, and experts assessing historic districts at Cape Lookout National Seashore.

Methods

Different methods were used to elicit responses from each of the stakeholder groups examined. Visitors' perceptions were gathered through on-site, structured interviews, which were audio recorded, transcribed and then coded for data analysis. It is important to note that this is the first instance of the NPS exploring visitors' perceptions of climate adaptation of cultural resources.

Community members' perceptions were gathered via semi-structured interviews with individuals with specific connections to CALO. We first compiled a list of individuals of former residents (owners or lessees) of Portsmouth Village and Cape Lookout Village, as well as their descendants. We expanded our sample to include other community members recommended by those on our list as having particularly strong connections to either historic district.

Partner and expert perceptions were gathered via separate online questionnaires; these questionnaires differed in content. Partners received an online questionnaire from one of two organizations: Friends of Portsmouth Island and the Core Sound Waterfowl Museum and Heritage Center. Experts were identified by NPS staff at either the Washington Support Office or the Southeast Regional Office who were known experts in the field of cultural resource management or historic preservation.

Sampling strategy & instrument

All instruments and protocols were reviewed and approved by the Institutional Review Board for research with human subjects at North Carolina State University, as well as by the Office of Management and Budget (OMB Control Number 1024-0224). No incentives for participation were provided.

Visitor survey

Strategic and convenience sampling strategies were used for this visitor survey to accommodate uneven distribution of visitation throughout the year and within the districts. The introductory script and visitor questionnaire can be found in Appendix A. Individuals who refused to participate were asked to complete three brief non-response bias check questions.

Fall season sampling occurred over two weeks in November 2015 (Cape Lookout Village only: November 6th – 8th, November 11th – 14th). During this sampling period, visitors were intercepted by two research assistants near the Cape Lookout Lighthouse (Cape Lookout Village) or at the Visitor Center in Portsmouth Village. The summer sampling was conducted at Cape Lookout Village on May 29th – 31st, June 3rd – 7th, June 15th - 18th, July 13th – 16th, and August 14th – 16th, and at Portsmouth Village on June 28th – 30th, July 6th – 10th, and July 24th – 28th.

The structured interview instrument was designed to capture visitors' motivations for visiting a historic district at Cape Lookout National Seashore, their perceptions of districts' vulnerability to climate change impacts, their perceptions of climate change adaptation actions to the historic buildings, and their connections to Cape Lookout National Seashore.

The instrument contained a combination of open-ended and closed-ended response questions. The open-ended questions were designed to elicit descriptive information that could be coded using content analysis and quantified, as well as provide quotes that complement the quantitative information. No personally sensitive data were collected in this survey.

Community member interviews

Strategic and chain referral sampling (Corbin & Strauss, 2008) were used to generate data with community members. The sampling goal was not to have a representative sample that can be quantified, but rather to gain in-depth understanding of some key community connections to the cultural resources at Cape Lookout National Seashore, perceptions of climate change threats to those resources, and perceptions of adaptation strategies for those resources. The sampling criteria included individuals who lived in one of the historic districts (owning or leasing one of the buildings) and their descendants (strategic sampling), as well as individuals recommended by other participants to have vested interest in cultural resource management decisions (chain referral sampling).

Sampling began with a list of individuals identified by park managers and the director of a NPS partner organization (Core Sound Waterfowl Museum and Heritage Center). Then, each person interviewed was asked to identify other community members with strong connections to either of the villages. Additionally, those individuals who declined to participate in the study were asked to provide a rationale for not participating and to identify other community members with strong connections to either of the villages.

Each individual was contacted by telephone and/or email (depending on contact information provided) to explain the purpose of the study and request their participation. If agreeable, a date was set for an in-person interview at a location convenient for the participant. Prior to interviewing, the study's purpose was again explained and each individual was asked to sign an informed consent form which ensured that all participants understood the voluntary nature of the research and any risks or benefits they may receive from participating.

Questions in the interview guide (Appendix B) were designed to be open-ended with the possibility for the interviewer to follow up with additional questions to elicit more detail or to clarify the meanings of previous statements (i.e., probing; Patton, 2002). The questions also include specific probes for information to evoke responses about certain subtopics if the subtopic did not arise during the initial response to the open-ended question. This approach minimizes bias (Patton, 2002).

Partner survey

To determine what current partner organization members thought about climate-related threats within the two historic districts, a survey questionnaire was developed to measure their connections to Cape Lookout National Seashore and perceptions of key resources, threats, and adaptation opportunities. Two partner organization were identified: the Friends of Portsmouth Island (i.e., FPI), and the Core Sound Waterfowl Museum and Heritage Center (i.e., Core Sound).

A key contact at each of the partner organizations were identified and asked to provide the email list for their respective membership base. FPI provided this information to the research team, while Core

Sound decided to administer the emails with survey links themselves. Survey administration began with an invitational email with survey link, followed by three separate reminder emails. The survey questionnaire was administered through an online survey administration software (Qualtrics).

The questionnaire was organized into four components: (1) measuring partners' connections to Cape Lookout National Seashore, (2) gauging partners' perceptions related to site conditions, (3) evaluating the extent of changes they've witnessed at the park unit, and (4) assessing partners' perspectives on possible adaptation strategies to address vulnerability of CALO structures. The questionnaire also included measures of participants' membership with one or both of the organizations and demographic information (age, gender, zip code). Responses to the survey items were primarily measured on Likert-type scales (response categories for individual items are presented in the results section).

Expert Survey

Purposive sampling (Tongco 2007) was used to recruit the experts actively working in the field of cultural resource management and historic preservation. A list of 85 experts was developed by the NPS staff at the Washington Service Office and the Southeast Regional Office. This list included experts from federal (i.e., NPS) and state governments (i.e., State Historic Preservation Offices), as well as non-profit organizations (e.g., National Trust for Historic Preservation, tribal organizations), academia, and private architectural and engineering firms.

The experts were contacted by email informing they would be phoned during the same week to receive an invitation and instructions for completing the questionnaire. A week later the expert received an email with a link to the survey instrument and questionnaire instructions. Two email reminders were sent approximately after one and two weeks. Once the experts completed the questionnaire, they received no further reminders. A final follow-up email was sent to those experts who only partially completed the questionnaire, and to non-respondents to encourage their participation.

The online questionnaire for experts had four sections: (1) 6 close-ended questions about professional background and work experience of the expert; (2) 4 open-ended questions about the cultural resource policy and practice challenges presented by sea level rise and stronger or more frequent storms in coastal environments, as well as 4 open-ended questions to assess needs and strategies to overcome those challenges; (3) 20 Likert-scale questions about the importance of prioritization criteria for historically designated buildings in adaptation planning; and (4) a section that asked experts to assess five randomly selected historic buildings and evaluate these buildings based on (a) background information (historical significance) and (b) an interactive visualization tool that illustrated moderate (A1B) and high (A1F1) sea level rise projections for 2025, 2050, 2075, and 2100.

Analysis

Analysis for each of the individual data sets (visitors, community members, partners, and experts) was conducted separately using multiple methods (e.g., qualitative and quantitative analyses where appropriate). In this report, we present results from the individual analyses, as well as present

comparative findings that synthesize results across the four studies. These comparisons are exploratory and intended to help managers more easily identify trends in which stakeholder perceptions are similar or divergent. It is important to recall that data generated and analyzed using diverse techniques cannot be analyzed for statistically significant differences.

Visitors

Visitor interview data were transcribed from the audio recordings. Transcriptions were then coded to reflect measurement items within the survey guide using numerical keys in Excel. The resulting Excel file was uploaded into the Statistical Package for the Social Sciences (SPSS v. 24) for analysis, including descriptive statistics (e.g., frequencies, distributions) and comparison between groups.

Community Members

The qualitative data generated from the Community Member interviews were transcribed and analyzed using thematic analysis. Two researchers independently read through all of the transcripts to gain a general idea of the information contained in the interviews and the contextual tone of the interviews (Creswell, 2003). Then, a three-stage coding process (open, axial, and selective coding) was initiated (Corbin & Strauss, 2008).

Open coding was used first to pinpoint themes, critical terms, and key events. Then, axial coding organized the initial codes and concepts by looking at interactions, thinking about causes and consequences, and identifying categories that could be combined. Finally, selective coding yielded major themes that guided the analysis. During selective coding, previously identified themes guided researchers' combing through the data for illustrative cases and potential convergence or polarity (Corbin & Strauss, 2008). QSR N*VIVO software was used for data organization during the coding and analysis process.

Partners

A two-step process was used to generate the results from the partner survey data. First descriptive statistics were performed to illustrate responses of the combined partner organization members and descriptive differences in mean responses between members of FPI and Core Sound. Second, Mann-Whitney u-tests were used to analyze differences in mean responses between participants who had (or family had) owned, or occupied through a lease, buildings at either Portsmouth Island or Lookout Village and those participants who had never resided (or never had family who did) on the island. Only those differences between former residents and non-residents that were statistically significant ($p < .05$) are presented in the results section of this report.

Experts

To analyze the qualitative data from the open-ended questions in the expert survey, we used content analysis (Webber, 1990). Data were downloaded as text into a Microsoft Excel spreadsheet and coded by one researcher; then, the pattern of coding was corroborated by a second researcher who also suggested additional coding considerations. Quantitative data were entered into a separate Microsoft Excel spreadsheet and descriptive statistical analyses were performed.

Results

Results presented in the following sections represent descriptive statistics and exemplary quotes from interviews or open-ended questionnaire items. Statistics and narratives illustrate the mean values and perceptions of stakeholders and commonly held sentiments. Please note that sampling procedures differed for each stakeholder group and the sample size of some stakeholder groups were limited; as such, tables and figures should be interpreted with these limitations in mind. These results should not be generalized to other cultural resource management contexts as they are specific to the Cape Lookout National Seashore stakeholders who participated in surveys and interviews. Additionally, the use of qualitative methods and/or the unknown sample populations limit the ability to generalize to each stakeholder groups' sample population. Results are presented topically; that is, interview and survey data from the four stakeholder groups are presented alongside one another to make comparison across three main topics: (1) place meanings, (2) adaptation strategies, and (3) preservation priorities. Results presented are intended to demonstrate common and distinguishing perceptions among the various stakeholder groups on these three topics.

Participant profiles

Descriptive participant profiles were developed for each of the stakeholder groups examined by the four studies. A profile offers an understanding of the sample population for each of the stakeholder types. These profiles should be considered in the interpretation of subsequent results, as age, gender, site use history, and sample size can influence other findings.

Visitors

A total of 253 visitors were intercepted, of which 216 individuals voluntarily agreed to participate in the study (85% response rate). Of the visitor respondents, the majority were intercepted in the summer sampling period (88%) and within the Cape Lookout Village sampling locations (82%). After data cleaning procedures were performed including removing cases in which 50% or more of the questions were not answered or inaudible on the recordings, our data set consisted of 158 usable cases (completed questionnaires).

The respondents represented a mix of both first-time and repeat visitors (55% and 45%, respectively). Nearly one-half of respondents (48%) were traveling in small groups (3 people or fewer) and one-third of respondents (34%) were traveling in moderately sized groups (4 or 5 people); the remaining proportion of respondents (18%) were traveling in large groups (6 or more people). The respondents tended to be middle-aged adults, with the largest proportion of the sample between 40 and 60 years old (48%).

Community members

Thirty-six names were collected as potential participants for the study (12 were provided by the NPS, 15 were provided by the director of a partner organization, and 9 new names were provided by other participants). Of these 36 individuals, 22 had current contact information, 6 did not have current contact information, 5 did not respond to invitational messages, and 3 did not wish to participate for the following reasons: not feeling qualified, not having time or interest, and not being able to schedule an interview during the sampling period. Although the original sampling list for this study

included only individuals with direct connections, the chain referral approach increased the breadth of our sample beyond just those who were residents or descendants of former residents, as we followed all suggested leads for people with "strong connections" to one or more of the districts. When thematic saturation was reached (i.e., no new themes were emerging from interviews), a total of eighteen participants had completed the interview process for this study.

Thirteen participants were male, and five were female. Only three participants were under the age of 50, while the rest of the participants were between the ages of 50 and 85. Since we followed all suggested leads for people with 'strong connections' to one or more of the districts, individuals in the participant pool were connected to Cape Lookout National Park in a variety of ways, including: being born on the island, being descendants of former residents, having previously owned homes in one of the villages, growing up in the area and frequently visiting one or both districts, vacationing within the districts, and volunteering or working for the NPS within the districts.

Partners

A total of 359 partner organization members participated in the survey. After data cleaning and organization, a total of 261 usable responses were retained for data analysis (106 responses were from FPI members, 170 from Core Sound, with some individuals identifying as members of both or neither one of the organizations). Cases were removed due to incomplete data (missing several responses) and participant drop-out (i.e., no responses after a certain point in the questionnaire).

A little over one-half (56%) received the link to participate form the Core Sound Waterfowl Museum and Heritage Center, about a third (31%) received the link from FPI. A few participants received the link from both groups (9%) and the smallest percentage (4%) did not directly receive the invitation to participate from a partner organization, but had the email forwarded to them by another member who had directly received the invitation to participate.

The mean age of survey participants was 65 with Core Sound-affiliated participants only slightly younger (mean age 64) than FPI-affiliated participants (mean age 66). Gender was nearly evenly split (50% male, 48% female, 2% declined to specify) for each of the organization's memberships. Some participants provided a home zip code and a zip code of a secondary address. Based on these geolocations, we can tell that most participants primarily reside throughout the state of North Carolina. Some participants reported a primary address in a zip code of other southeastern states such as Virginia, Maryland, Tennessee, South Carolina, and Georgia. There were very few participants reporting a primary zip code outside of the southeast US. Of those who reported a secondary address, most were located in zip codes along the inner and outer banks of North Carolina.

Most partners participating in the survey had last visited Cape Lookout National Seashore during the year the survey was administered (2016) or the previous year. The average year of first visit for the combined sample was 1982; slightly earlier for Core Sound members (1979) than FPI members (1984). On average, respondents had visited the park unit 3 times in the past twelve months. Core Sound-affiliated participants visited more frequently (mean number of annual visits = 4) than FPI-affiliated participants (mean number of annual visits = 1 or 2). The majority of participants (82%) had not personally, or did not have family who had, previously leased or occupied a building in the

park unit. Very few (2%) of FPI-affiliated respondents had personally occupied a building, while a greater proportion of (24%) had family who had lived or leased property there. For Core Sound-affiliated respondents, there was a more even split (7% each) between participants who had personally, or had a family member that had, previously occupied a building.

Experts

Of the 85 experts sent the initial email request, 39 completed the questionnaire and 6 sent reply notifications that they did not feel qualified (lack of expertise or in-depth knowledge). An additional 4 respondents sent notifications that they did not have the time to complete the questionnaire, while one expert declined to complete it due to his disbelief in anthropogenic climate change. After removing those who did not feel qualified to complete the questionnaire, our total sample size was 79, which resulted in a 49% response rate.

Nearly one-half of experts worked for federal government (44%), followed by state government (20%), private contractor or consultant (15%), academic institution (10%), historic preservation organization (8%) and local government organization (3%). The average number of years of experience in their current profession was 9 years (range between 1 and 20 and more years), and the average number of years employed in the current work organization was 13 years (range 3–20 and more years).

About one-third of experts (38%) had only one cultural resource management or historic preservation employment experience, while nearly another third (28%) had their current and one previous employment experience. About one in five experts (21%) had during their period of employment three positions, and a few experts had four (8%) or five (5%) cultural resource management or historic preservation employment experiences.

Nearly two-thirds of experts conducted their work in South Atlantic region (25%), Gulf Coast region (21%), or the Mid-Atlantic region (10%), North Atlantic region (8%). Some respondents reported that most of their work experiences was in other regions: Great Lakes and Central US regions (both 6%), Rocky Mountain and California (both 5%), Pacific Northwest and Caribbean regions (both 4%), internationally (3%), Pacific Islands (2%) and Southwest region (1%).

Place meanings

Place meanings are the tangible (e.g., the landscape supports one's economic livelihood) and intangible (e.g., the landscapes constitutes one's identify) values that individuals assign to geographic spaces. Place meanings are important in understanding how individuals and groups connect to places. Place meanings may also offer nights into other relationships people have with places, such as their preferences for climate change adaptation strategies. Three of the four stakeholder groups assessed for the Cape Lookout National Seashore project: visitors, community members, and partners, were asked about the place meanings they imbue on the site.

Visitors

Several statements about place meanings (place attachment, place dependence, family identity, historical and cultural values) were read to visitors. The statements included:

☐ I have a personal attachment to the history and culture here at Cape Lookout.

☐ I get more satisfaction from visiting Cape Lookout than from other historic or cultural sites on the Outer Banks.

☐ There are important family memories tied to the history and culture associated with Cape Lookout.

☐ I feel that Cape Lookout is an important part of our nation's history.

☐ I believe that the history and culture associated with Cape Lookout are unique and unlike others in the region.

☐ It is important that the historical and cultural resources at Cape Lookout are preserved and protected for future generations.

Then, visitors were asked to state the number that represented the extent to which they agreed or disagreed with each statement using a Likert-type scale from 1 (strongly disagree) to 5 (strongly agree), with 3 being neither agree nor disagree. Then, we transformed the scale to a -2 (strongly disagree) to +2 (strongly agree) scale to enhance data visualization. Respondents' agreed most strongly with the statements regarding Cape Lookout National Seashore's historical and family identity (Figure 2). It is worth noting that visitors generally had the most difficulty gauging their agreement with the statement "I get more satisfaction from visiting Cape Lookout than other Outer Banks historic/cultural sites." Many respondents talked about how they get more satisfaction from visiting the Outer Banks in general even though they also felt that was about Cape Lookout National Seashore.

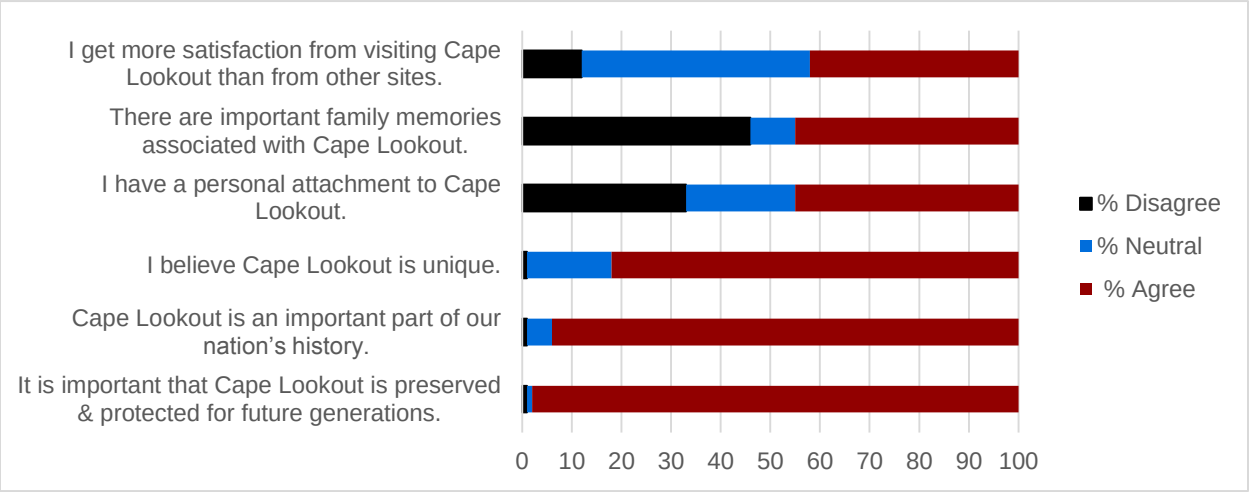

Figure 2. Visitors place meanings. The above graph depicts the proportions of the 158 visitors analyzed who agreed, disagreed, or were neutral in regards to each of the place meaning statements they were read.

Community members

Interviews revealed that Cape Lookout National Seashore holds deep and diverse meanings for the community members who participated in the study (Figure 3). Sentimental values and the iconic community symbol of the Cape Lookout Lighthouse contribute to the place meanings that evoke a sense of home and fill study participants with feelings of pride and deep affection for the park's cultural resources. Participants associated their place meanings with a powerful spirit of heritage and fond memories of tradition. Additionally, CALO is meaningful to community members as a means of escape, or a sacred retreat; it is their favorite place to be, and they passionately described the special qualities that make CALO remarkable.

The cultural resource values held by community members contribute to members' history and family memories, growing up and existing with the sea, fishing and hunting traditions, recreation, spirituality, and emotional and sentimental values. Several participants also expressed that the people of CALO (community members) are the true cultural resource, as they hold these values within themselves. Relationships between community members' cultural values and associated place meanings are illustrated in Figure 3.

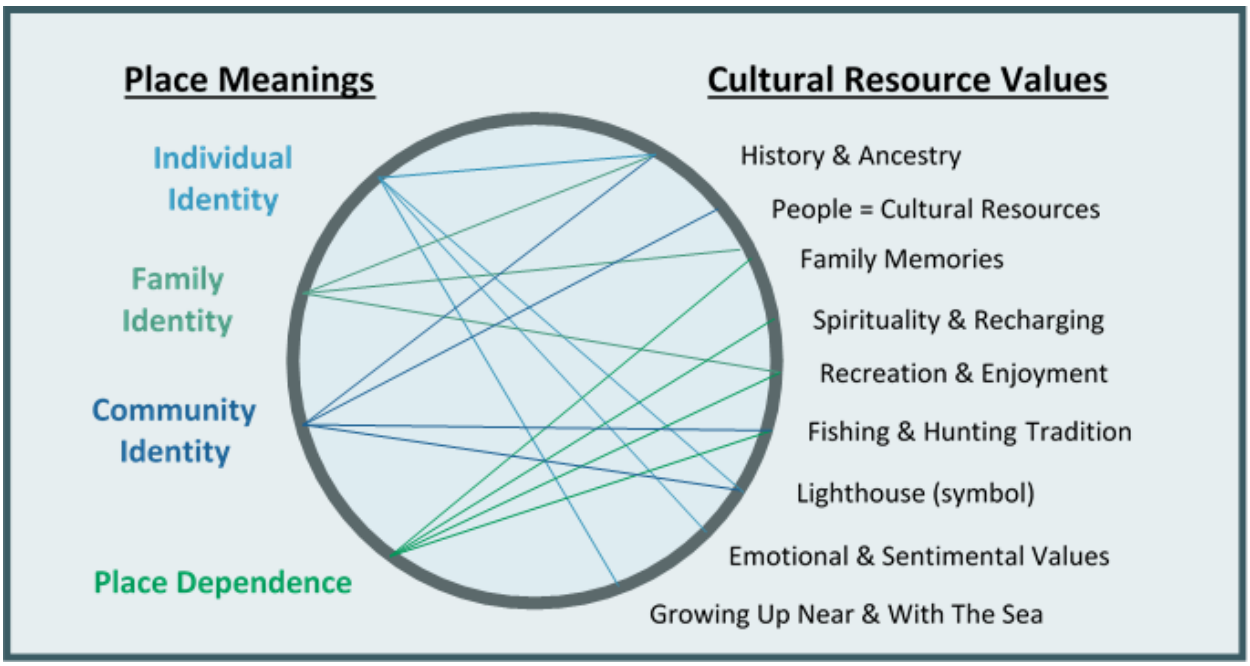

Figure 3. Relationships between community members' place meanings & cultural resource values. This figure reflects the place meanings of the 18 participants in community member interviews.

Partners

Partners were asked to identify to which areas at Cape Lookout National Seashore they felt most connected (Table 1). For FPI-affiliated respondents, their strongest connections were to Portsmouth Village while Core Sound-affiliated respondents felt most connected to the Cape Lookout Lighthouse. Core Sound members were more likely than those affiliated with FPI to report that they felt connected to all parts of the site. However, Core Sound members were also more likely to say

they had no connections (8%; no FPI members reported this lack of connection). The Coast Guard and Summer Cottages sites held the least connection for partner organization members.

We also explored partners' connections through a series of statements intended to measure different types of place meanings such as: (1) individual connections, (2) family connections, (3) community connections, and (4) national connections. Reponses to the statements were made on a 5-point, bi-polar, Likert-type scale with options of: (-2) strongly disagree, (-1) disagree, (0) neither agree nor disagree, (1) agree, and (2) strongly agree (Table 2). Respondents agreed most strongly with the two measures of national connection (Cape Lookout is an important part of our history as a nation, $\overline{x}$ = 1.57; Preserving the history and culture associated with cultural resources at Cape Lookout is important for future generations, $\overline{x}$ = 1.72) and disagreed with the individual connection statement that "what happens at Cape Lookout doesn't matter to me"

Table 1. Partner organization members' (n=261) connections to Cape Lookout National Seashore.

Which of the following areas are you most connected to at CALO?	**Total n (%)**	**FPI n (%)**	**Core Sound n (%)**
Portsmouth village	86 (33%)	79 (74%)	16 (9%)
Cape Lookout Lighthouse area of CALO village	70 (27%)	3 (3%)	69 (41%)
Both Cape Lookout & Portsmouth village equally	45 (17%)	19 (18%)	31 (18%)
All of Cape Lookout village	42 (16%)	4 (4%)	38 (22%)
I do not feel connected to either village	14 (5%)	0	13 (8%)
The Coast Guard & Summer Cottages area	4 (2%)	1 (1%)	3 (2%)

Table 2. Partner organization members' (n=261) meanings for Cape Lookout National Seashore.

Partner organization place meaning items	**Mean[1] (SD)**
Individual connections *(composite)*	*0.93 (0.64)*
I feel Cape Lookout is a part of me.	1.03 (0.92)
I identify strongly with Cape Lookout.	1.13 (0.92)
What happens at Cape Lookout doesn't matter to me.[2]	1.58 (0.83)
No other place can compare to Cape Lookout.	0.95 (0.99)
Few people know Cape Lookout like I do.	-0.05 (1.07)

[1]Response options: (-2) strongly disagree, (-1) disagree, (0) neither agree nor disagree, (1) agree, and (2) strongly agree.

[2]This item was reverse coded. This technique is used because this item is negatively worded while all other items are positively worded. Reversing the coding of the Likert-type scale responses for this item allows us to compare the mean response of this item in the same way as the means responses for the other items.

Table 2 (continued). Partner organization members' (n=261) meanings for Cape Lookout National Seashore.

Partner organization place meaning items	Mean[1] (SD)
Family connections *(composite)*	*-0.40 (0.95)*
My family's income or livelihood depends on Cape Lookout.	-1.27 (0.95)
Many important family memories are tied to Cape Lookout.	0.48 (1.39)
Local community connections *(composite)*	*1.08 (0.76)*
Local communities' history is strongly tied to Cape Lookout.	1.38 (0.94)
The local economy depends on Cape Lookout.	0.87 (0.89)
National connections *(composite)*	*1.60 (0.58)*
Cape Lookout is an important part of our history as a nation.	1.51 (.654)
Preserving the history and culture associated with cultural resources at Cape Lookout is important for future generations.	1.69 (.614)

[1]Response options: (-2) strongly disagree, (-1) disagree, (0) neither agree nor disagree, (1) agree, and (2) strongly agree.

[2]This item was reverse coded. This technique is used because this item is negatively worded while all other items are positively worded. Reversing the coding of the Likert-type scale responses for this item allows us to compare the mean response of this item in the same way as the means responses for the other items.

Place meanings: Synthesis

In review, community members described strong place connections, while partner organization members' personal connections were moderate and visitors reported relatively neutral place connections (place connections of experts were not measured). However, both members of partner organizations and visitors felt strongly that Cape Lookout National Seashore is unique and has importance to the nation and future generation. Community members place meanings were most strongly centered on intangible meanings and values. Few respondents from any of the stakeholder groups reported strong place meanings related to economic values of Cape Lookout National Seashore (e.g., that they depended on the site for economic benefits).

Adaptation strategies

Each of the four stakeholder groups were asked about their preferences for various adaptation strategies. However, the question framing for each group differed. Additionally, different groups were presented with different suites of adaptation strategies to review (e.g., visitors were asked generally about moving, removing, and relocating structures in general, while experts were asked to select one of seven specific strategies for individual buildings).

Visitors

Visitors were asked if they were aware that the structures at Cape Lookout could be damaged by climate-related risks, such as flooding or gradual sea level rise. Nearly all respondents indicated that they were aware of the risk of damage (97%). Only one respondent indicated that they were unaware of climate-related risks to the structures and another two respondents indicated that they understood

that the structures were vulnerable to these risks but had never previously considered the risks. Following this introductory question, the research assistant described three different adaptation scenarios to manage potential damage and asked respondents how each strategy might change their experiences at Cape Lookout National Seashore. The adaptation scenarios presented were to:

- ☐ elevate vulnerable buildings;
- ☐ move vulnerable buildings to safer locations within the Historic District;
- ☐ and remove vulnerable buildings and provide information about the building where the building once stood through interpretive signs.

About one-half of respondents explained that elevating (58%) or moving structures (46%) would not change their experience (Figure 4). Conversely, respondents most frequently explained that removing structures from the landscape would negatively impact their experience (75%). Several respondents indicated that they wouldn't like it if the buildings were elevated (9%), moved (12%), or removed (5%) but that they would understand the need for such actions.

Participants' responses portray the generally positive sentiments about elevating or moving buildings to avoid climate change related damages. For example, one respondent said:

"If the structures were threatened by rising sea level or a climate where there are more fierce hurricanes I think it is a natural expectation to see if the buildings are going to be preserved it would be perfectly natural to raise the elevation of the buildings to preserve them."

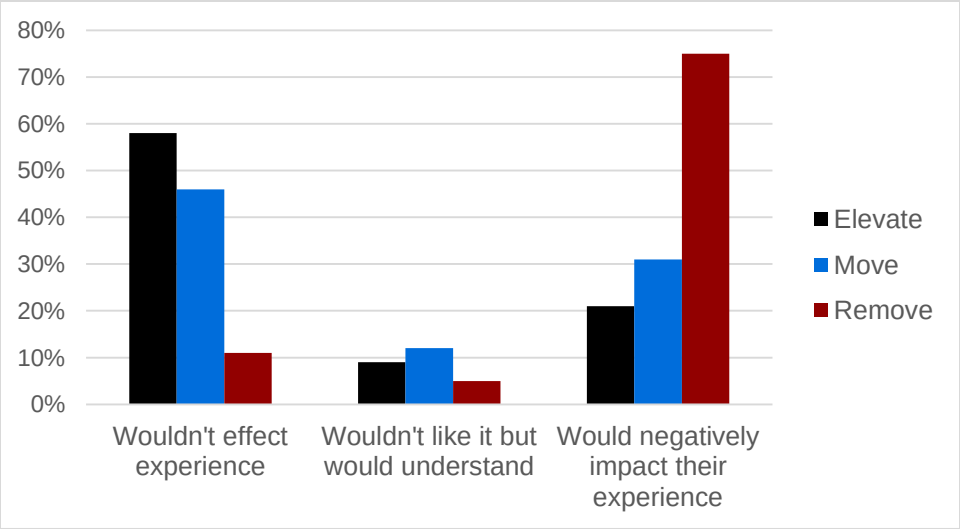

Figure 4. Visitors' perceptions of adaptation strategies. The figure depicts, proportionally, how the 158 visitors analyzed perceived three various adaptation strategies.

Another respondent explained: *"I don't think it would bother me. I don't think I'd know it [moved] unless someone told me."* Additionally, several respondents indicated being familiar with the Outer

Banks area and talked about how they remembered the relocation of the lighthouse at Cape Hatteras National Seashore:

"As long as it protected them so more people could come years later. I know at one point at Cape Hatteras you could go up in it, but then the next time we came we couldn't go up because they were moving it. I don't see anything wrong with them doing whatever they have to, to preserve it."

Yet, a few respondents expressed ambivalence towards moving the buildings because, although they want to see them protected, they were concerned that their historical significance is associated with where they originally stood:

"I don't think I'd want you to move them but at the same time you can't predict mother nature. It would be a shame if a hurricane destroyed them..."

Although visitors generally expressed that they did not like the idea of removing vulnerable buildings and providing interpretive materials where they once stood, a few respondents talked about "letting nature take its course" if elevating or moving buildings is not an option.

"I understand returning things back to their natural state but the island was habituated by humans and there's history here, so to just let that go away and just put signs up seems kind of detrimental to the revenue and to the community as well because nobody just wants to come look at signs. Anybody can go to a beach… because then it just becomes a beach."

These respondents were concerned that removing them would eradicate the historical significance and affect the uniqueness of Cape Lookout National Seashore, as well as the economic vitality of nearby communities.

Community members

When discussing types of actions that could be taken to adapt to climate impacts, community members identified several different types of actions and described the action's viability. In terms of structural and landscape changes, there was some support for beach nourishment as one of the least invasive actions that could be taken to slow the effects of erosion. Beach nourishment is the manual deposition of sand to replace sand that was lost from storm-related erosion or long-shore drift to provide a buffer against future storm surge. Although it is considered a soft measure and often preferred to hard fixes (e.g., seawalls and groins) that alter the aesthetics of a landscape and tend to have negative impacts on adjacent stretches of shoreline, beach nourishment is contested by community members because (a) it can negatively impact the flora and fauna of the area and (b) it is not a one-time fix but rather typically one that must be continued every few years. The preferred but contested nature of beach nourishment is exemplified in the following quote: "I'd say [beach] nourishment is very good. And that's not popular all over the country."

Few community member participants supported elevating or moving buildings, providing the rationale that it was preferable to complete loss of the buildings. However, more participants were not supportive of these drastic measures, explaining that it would take away from the character and integrity of the historic districts. Additionally, some participants were receptive to one of these

actions but not the other. Those who preferred elevating buildings felt that it was more important to keep the buildings in their context, while those who preferred moving buildings felt that aesthetics and structural integrity were of upmost importance.

In general, participants perceived that engineered solutions would likely have unintended consequences to the historic value of the districts. The most popular strategy involving structural changes was increased restoration and maintenance to strengthen the buildings against current and future impacts. Such restoration and maintenance can be considered a way to improve the resilience, or more appropriately the adaptive capacity, of the building to the near-term threats identified by participants. Additionally, an increase in interpretation including more public displays, documentation, research and oral histories, signage for non-extant buildings, and enhanced public awareness of Lookout Village was typically viewed more favorably than costly structural or landscape adaptations.

Partners

Partners were asked how desirable they believed seven different types of strategies were for CALO cultural resources (see Table 3). Partners rated the desirability of these adaptation strategies on a 5-point Likert-type scale with response options of: (1) not at all desirable, (2) slightly desirable, (3) somewhat desirable, (4) very desirable, and (5) extremely desirable. Partner members did not perceive these strategies as being very or extremely desirable. The most desirable (rated as somewhat desirable) options were to "manage change" ($\overline{x}$ = 3.67), "interpret the change" ($\overline{x}$ = 3.46), and "improve resilience" ($\overline{x}$ = 3.02). Partners considered "document and release" and "leave things as they are" to be not at all desirable ($\overline{x}$ = 1.49 and 1.67, respectively). Core Sound members, on average, tended to perceive each of the adaptation strategies as more desirable than FPI members.

As a follow up to their perceptions of adaptation strategy desirability, partner organization members were asked to rate how they perceived these seven strategies may influence their connection to Cape Lookout National Seashore (Table 3). Influence on connection was measured on a 5-point, bi-polar, Likert-type scale with repose options of: (-2) significantly less connected, (-1) somewhat less connected, (0) no change, (1) somewhat more connected, and (2) significantly more connected. All adaptation strategies except "manage change," "interpret the change," and "improve resilience" were perceived as having the potential to make partners feel somewhat less connected. Logically, those adaptation strategies most desired by partners (Table 4) were the ones they perceived would enhance rather than diminish their connection to the site. FPI members felt more strongly than Core Sound members that "relocating" and "documenting and releasing" buildings would make them feel somewhat less connected to CALO.

Partners who were either former residents or descendants of former residents differed from those who were not residents or descendants of former residents in their perception of desirability for two adaptation strategies (Table 5). First, former residents found "leave things as they are" as not at all desirable while non-residents rated this technique as slightly desirable. Second, non-residents found "interpret the change" to be a very desirable adaptation strategy while former residents rated this technique as only somewhat desirable.

Table 3. Partners' perceptions of adaptation strategy desirability.

How desirable you think each of the following strategies are as an approach for adapting cultural resources?	**Total Mean (SD) (n=261)**	**FPI Mean (SD) (n=106)**	**Core Sound Mean (SD) (n=170)**
Leave things as they are	1.67 (1.09)	1.41 (.837)	1.81 (1.18)
Take offsite action	2.11 (1.22)	2.08 (1.20)	2.11 (1.23)
Improve resilience	3.02 (1.16)	3.09 (1.20)	2.92 (1.12)
Manage change	3.67 (1.11)	3.56 (1.16)	3.70 (1.11)
Relocate	2.20 (1.08)	2.08 (1.07)	2.24 (1.10)
Document and release	1.49 (.901)	1.38 (.822)	1.52 (.912)
Interpret the change	3.46 (1.16)	3.46 (1.20)	3.38 (1.15)

Table 4. Partners' perceptions of impacts to their connections due to adaptation at CALO.

How may the strategy affect your connections to Cape Lookout?	**Total Mean (SD) (n=261)**	**FPI Mean (SD) (n=106)**	**Core Sound Mean (SD) (n=170)**
Leave things as they are	-0.38 (1.05)	-0.47 (1.10)	-0.35 (1.02)
Take offsite action	-0.24 (1.01)	-0.26 (1.01)	-0.26 (1.05)
Improve resilience	0.34 (.908)	0.33 (.933)	0.34 (897)
Manage change	0.49 (.835)	0.37 (.865)	0.55 (.821)
Relocate	-0.26 (1.00)	-0.53 (.997)	-0.20 (1.02)
Document and release	-0.58 (1.18)	-0.75 (1.20)	-0.51 (1.17)
Interpret the change	0.38 (.836)	0.32 (.868)	0.41 (.867)

Table 5. Differences in adaptation desirability based on prior residency at CALO.

Responses	**Non-residents Mean (SD) (n=217)**	**Former residents Mean (SD) (n=44)**	**Mann-Whitney U, p**
Leave things as they are	1.73 (1.11)	1.43 (.972)	4173.0, .030
Interpret the change	3.54 (1.15)	3.09 (1.120)	3967.0, .019

Experts

Experts (n=39) were asked to recommend one of seven adaptation strategy for a randomly assigned set of five buildings at Cape Lookout National Seashore. These recommendations followed descriptive information about the building's historical significance and geovisualizations of the building's vulnerability to sea level rise projections.

The most often selected adaptation strategy, was to improve building's resilience. Improving resilience was selected by at least one participant for each of the buildings included in the assessment. Document and release was the next most selected strategy, followed by leave things as they are and manage change. These results illustrate that survey participants felt strongly that a building should either be fortified (improved resilience) or released (after documentation). These options (fortify/release) could be viewed as opposites on a spectrum of strategies for the most vulnerable buildings. For example, nearly half of participants who assessed the Coast Guard Station (perceived as highly vulnerable) recommended improving its resilience, while over a third of those who assessed either the Keeper's Quarters and Lifesaving Station (also perceived as vulnerable) felt these buildings should be documented and released. Managing change and leaving things as they are, on the other hand are commonly applied strategies for buildings perceived as less vulnerable (e.g., these options were selected for Frank Gaskill House, Life Saving Summer Kitchen, Methodist Church, and Tom Gilgo House, among others).

While relocation was selected as an option for many buildings, in most cases only one participant selected this for any given building. On the other hand, many (43%) of those who assessed the Coca Cola House selected the relocation option. Other less common options included take offsite action and interpret the change. For those buildings which did have participants assign off-site action or interpretation, these were not the dominant strategies for those buildings (i.e., only one participant selected this strategy for any given building). These results may imply that these strategies (off-site action and interpretation) are less favorable or appropriate for the buildings included in the study. However, these results may also be illustrating experts' unfamiliarity with these strategies. Perhaps, with elaboration on how to take off-site action or interpret the change, these options would become more commonly selected. Alternatively, these actions may be viewed as complementary but secondary to other actions (e.g., desirable if used in combination with other adaptation strategies).

Adaptation strategies: Synthesis

Community members and members of partner organizations were most similar in their preferences for adaptation strategies which focused on maintenance and documentation-based adaptation (e.g., managing change, improving resilience and interpreting change). Interpretation as an adaptation strategy was least favorable among visitors who expressed they would not be as interested in visiting a sign as they would be in viewing an actual structure and experts seldom selected interpretation as an action for any given historic building that they evaluated.

Partners and visitors agreed that removing or documenting and releasing buildings would negatively affect their connections to Cape Lookout National Seashore. Community members also felt moving or elevating structures would alter their place connections. However, experts selected moving as a

recommended strategy, especially in cases where their perceptions of vulnerability and certainty of impact (after viewing the sea level rise geovisualizations) for historic buildings was high.

Experts and partners differed somewhat substantially in their preferences for adaptation. The most commonly selected strategies by experts included document and release and leave things as they are, while these were considered least desirable by partners. Additionally, partners most desired (but only "somewhat") interpreting the change, while experts infrequently selected this strategy.

In general, keeping buildings in place through maintenance and improved resilience emerged as the most preferable adaptation strategies from the four stakeholder groups sampled in these studies.

Preservation priorities

The National Park Service issued policy (PM-14) guidance for managers to prioritize the most vulnerable and most significant cultural resources for climate adaptation. However, managers also need to consider the values and preferences of various stakeholder groups during planning and management processes. We present and compare some preservation priorities for Cape Lookout National Seashore below based on findings from the four stakeholder studies.

Visitors

To gain more insight into visitors' perceptions of potential climate adaptation strategies at Cape Lookout National Seashore, respondents were asked to imagine themselves in the position of a National Park Service manager and describe how they would decide which buildings they would preserve first.

Most visitors listed particular buildings they would preserve in order of importance (Table 6). The Cape Lookout Lighthouse was a preservation priority to the majority of visitors intercepted in Cape Lookout Village (70%), followed by the 1873 Keeper's Quarters (47%). Several respondents even listed the order in which preservation of these buildings should occur:

"The lighthouse first because that's the whole reason this area exists. If it wasn't for the lighthouse it would just be a barrier island. Two would be the keeper's quarters. Three would be village complex itself. And then maybe the boardwalks last."

For the visitors intercepted in Portsmouth Village, the largest proportion explained that the Methodist Church should be prioritized (50%), followed by the two other community buildings (Schoolhouse, 25%; and Post Office and General Store, 25%).

Some general prioritization strategies were also offered by visitors (Table 7). The most frequently mentioned strategy was to focus on the historic value and significance when making prioritization decisions (13%). For example, one respondent explained that they would preserve: "The ones with the most history I guess. I don't know if those would be the oldest or the most relevant to the area." This strategy was most frequent among visitors intercepted at Portsmouth Village (42%). Other suggestions mentioned by respondents (regardless of intercept site) included: preserving the oldest and most weathered buildings first (9%) and to preserve structures that are the most intact (5%).

Table 6. Visitors' (n=158) suggestions of specific buildings to be preserved.

Priorities	% of full visitor sample (n=158)	% of Cape Lookout visitors (n=130)	% of Portsmouth visitors (n=28)
The Lighthouse	63	69	-
Keeper's Quarters	41	46	-
NPS structures	6	6	8
Methodist Church	5	-	50
The Schoolhouse	4	2	25
Coast Guard Station	3	3	-
Post Office & General Store	3	-	25
Portsmouth Island Lifesaving Station	1	-	17
The Barden House	2	2	-
The historic village (generally)	11	10	17

Table 7. General preservation strategies suggested by visitors (n=158).

Priorities	% of full visitor sample (n=158)	% of Cape Lookout visitors (n=130)	% of Portsmouth visitors (n=28)
Historic value & significance	14	11	42
Oldest and most weathered	8	8	8
As much as possible; everything	7	7	-
Most intact structures	4	5	8

Community members

Community members were specifically asked how important it was to them that prioritization of historic buildings and data generated through probing questions did not elicit this information. Therefore, we cannot report on the criteria that may represent community members' preservation priorities.

Partners

Partners were asked how important it was to them that prioritization of historic buildings be based on nine different criteria, such as those most visited by the public or those most strongly symbolizing national importance. Importance of each prioritization metric was rated on a five-point, Likert-type scale with response options of: (1) not at all important, (2) slightly important, (3) somewhat important, (4) very important, and (5) extremely important. Partner organization members felt that "historical value/uniqueness" and "national importance" were very to extremely important prioritization metrics. "Meaningfulness to a community of people," "scientific value," and "most

visited by the public" closely followed as other very important metrics. "Previous restoration" and "meaningfulness to a few people" were rated as somewhat important. The criteria "least expensive to maintain" and "least expensive restore" were of least importance to partners, although they were still perceived as slightly to somewhat important (see Table 8). In general, FPI members rated each of the metrics as slightly more important relative to Core Sound members' responses.

Only one statistical difference was found between former residents and non-residents in regards to these metrics for prioritization. Specifically, former residents and descendants of former residents differed from non-residents in their response to the metric "meaningful to a community of people." Intuitively, the former residents (members of the former CALO communities) agreed more strongly that this was very important ($\overline{x}$ = 4.26) than non-residents ($\overline{x}$ = 3.93; u=4035.5, p=.025).

Table 8. Partners' perceived importance of prioritization criteria (n=261).

How important is it that prioritization be placed on buildings that:	**Total Mean (SD) n=261**	**FPI Mean (SD) n=106**	**Core Sound Mean (SD) n=170**
Have been restored previously.	3.53 (1.10)	3.74 (1.12)	3.41 (1.12)
Are the least expensive buildings to restore.	2.80 (1.10)	2.99 (1.12)	2.75 (1.09)
Are the least expensive buildings to maintain in the future.	2.91 (1.09)	3.02 (1.16)	2.89 (1.09)
Are meaningful to a few people (e.g., a family).	3.01 (1.09)	3.22 (1.10)	2.94 (1.09)
Are meaningful to a community of people.	3.99 (1.02)	4.14 (1.03)	3.95 (1.03)
Are most visited by the public.	3.87 (1.08)	4.01 (1.07)	3.81 (1.08)
Have the highest scientific value (i.e., help us to better understand aspects of the past).	3.96 (0.96)	3.97 (1.00)	3.95 (0.94)
Hold particular historical value because of its uniqueness (e.g., only one like it).	4.38 (0.85)	4.48 (0.80)	4.31 (0.89)
Symbolize something of national importance.	4.30 (0.93)	4.28 (0.98)	4.28 (0.95)

Finally, partners were asked how important is was the prioritization be singularly placed on the total cost of the restoration project. Participants felt this metric was somewhat important ($\overline{x}$ = 3.31 for both groups combined, $\overline{x}$ = 3.30 for FPI members, and $\overline{x}$ = 3.29 for Core Sound members). Total cost of restoration rated higher than the metrics of being least expensive to restore and maintain ($\overline{x}$ = 2.80 and 2.91, respectively). However it was still rated lower than historical and national significance, scientific value, meaningfulness to a few or many, high visitation, and previous restoration.

Experts

Experts (n=39) were asked to rate a longer list of prioritization criteria. Importance of each prioritization metric was rated on a five-point, Likert-type scale with response options of: (1) not at all important, (2) slightly important, (3) somewhat important, (4) very important, and (5) extremely important (results presented in Table 9).

The most salient criteria for prioritizing historically designated buildings for climate adaptation planning were the national importance of the historic building ($\bar{x}$ = 4.7) and being unique or the only historic building of its type across the cultural landscape ($\bar{x}$ = 4.6). Other very important criteria for prioritization included buildings with: the highest scientific value ($\bar{x}$ = 4.3), a central or prominent role in the cultural landscape ($\bar{x}$ = 4.2), the potential to experience the most immediate storm-related flooding and coastal erosion ($\bar{x}$ = 4.2), the potential to experience the most immediate sea level rise impacts ($\bar{x}$ = 4.1), the highest interpretive potential ($\bar{x}$ = 4.1), representation to the foundation of a community (e.g., the reason other historic buildings were built) ($\bar{x}$ = 4.1), and a programmatic function to a National Park site (e.g., a contributing factor to the designation of the site or listed as a foundational resource) ($\bar{x}$ = 4.1).

Conversely, experts noted that historic buildings that are meaningful to only a few people ($\bar{x}$ = 2.4) and is the least expensive preservation treatments or will be the least expensive to maintain ($\bar{x}$ = 2.6 and 2.8, respectively) were the least salient factors in prioritizing historically designated buildings for climate adaptation planning.

Table 9. Experts' (n=39) prioritization priorities

Criteria	Mean	SD	Min
Symbolize national importance	4.7	0.50	3
Hold a particular historical value	4.6	0.55	3
Have the highest scientific value	4.3	0.66	3
Play a central role in the cultural landscape	4.2	0.62	3
Urgency of flooding & erosion risk	4.2	0.68	3
Represent the foundation of a community	4.1	0.73	3
Serve a programmatic function to NPS site	4.1	0.67	3
Hold the highest interpretive potential	4.1	0.71	3
Urgency of sea level rise impacts	4.1	0.82	3
Are meaningful to a community of people	4	0.87	2
Severity of flooding & erosion risk	3.9	0.87	2
Severity of sea level rise risk	3.9	0.86	2

Table 9 (continued). Experts' (n=39) prioritization priorities

Criteria	Mean	SD	Min
Most visited by the public	3.9	0.65	3
Provide tourism revenue to community	3.8	0.92	2
Most vulnerable due to deferred maintenance	3.4	0.95	1
Operational (serves as visitor center)	3.2	0.91	2
Previous preservation treatment	2.9	1.16	1
Least expensive to maintain in the future	2.8	1.22	1
Least expensive preservation	2.6	1.13	1
Are meaningful to a few people	2.4	0.89	1

Preservation priorities: Synthesis

Three groups (visitors, members of partner organizations, and experts) were queried regarding criteria upon which preservation should be based. In general, all of these stakeholders (visitors, partners, and experts) agree that the historic value of buildings should guide adaptation efforts. Additionally, partners and experts find that structures of national importance should be prioritized for adaptation. Further, experts and partners also highly ranked potential and existing scientific value as key criteria upon which perseveration should be prioritized.

Visitors were most concerned with preserving the Lighthouse and Keeper's Quarters, and experts felt that those buildings that play a central role in a cultural landscape should be prioritized for preserved. Yet, visitors differed from other groups in their preference for prioritization based on the age of building and the most weathered buildings. Partners differed from other groups based on the opinion that meaningfulness to community was as important as the national significance in prioritizing buildings for adaptation efforts.

Summary of Findings

In terms of place meanings, community members described the strongest place connections, based largely on intangible values. Partner organization members had moderate personal connections and visitors reported the weakest place connections, with both of these groups reporting the strongest sentiments in relation to the uniqueness of Cape Lookout National Seashore and its importance to the nation and future generations. Strong place meanings related to economic values were not common.

Maintaining buildings and improving resilience were the most preferred adaptation strategies overall. Community members and partners were most similar in their preferences for managing change, improving resilience and interpreting change. Partners, visitors, and community members agreed that removing or documenting and releasing buildings would negatively affect their connection to Cape Lookout National Seashore, while experts commonly selected moving as a recommended strategy; yet, future research with experts should enable a combination of strategies to be selected, as it is unlikely that interpretation would be implemented as a standalone adaptation action. Additionally, partners somewhat desired interpreting the change, while experts infrequently selected this strategy and visitors reported that they would rather visit a structure than an interpretive sign.

Regarding prioritization for adaptation, visitors, partners, and experts agreed that the historic value of buildings should guide adaptation efforts. Partners and experts perceived that national importance as key and experts and partners also perceived potential and existing scientific value as key criteria upon which perseveration should be prioritized. Visitors were most concerned with preserving the Lighthouse and Keeper's Quarters (supported by experts' perceptions of those buildings as playing a central role in the cultural landscape and therefore high-ranking for preservation prioritization).

The results demonstrate that community members are most concerned with the intangible values of the seashore and would support preserving as many structures in their rightful places as possible to preserve the overall cultural landscape (or letting go rather then moving and elevating). Visitors are most concerned with having places to visit and learn about the site's history (elevation and relocation are preferred to interpretive signs). Partners were most favorable of interpretation as an adaptation strategy, and perhaps their connections to, and knowledge of, the site would lend them to suitable partners in preparing such interpretive materials. Lastly, experts offered more of an outside perspective, which perhaps led to their objective selection of removing buildings as an appropriate strategy; however, they also see the value in striving to maintain key structures that maintain the identity and integrity of the site.

Limitations

The generalizability of the results presented here, and the implications made based on these results, have limited generalizability to other cultural resource management contexts. The stakeholder preferences synthesized in this report are specific to Cape Lookout National Seashore stakeholders, specifically those sample populations who voluntarily participated in each of the stakeholder studies conducted between 2015 and 2016. Limitations exist for specific groups studied as well. The nature of the qualitative methodologies employed in the community member interviews, particularly the use

of chain referral sampling, are not intended for generalization but rather to provide in-depth descriptions of study participants' perceptions and preferences. Similarly, the open-ended nature of many questions within the visitor structured interviews only capture the most salient perceptions and preferences, which limit the generalizability of those findings. In the expert survey, participants may have been limited by their own knowledge of various adaptation techniques, as climate change adaptation/management is an emerging area within cultural resource management and historic preservation. Additionally, the reliability of partner perceptions is limited by the fact that the total population of that group is unknown and, therefore, whether or not a representative sample was acquired cannot be assessed. For a more thorough discussion of limitations related to each of the stakeholder studies please see those individual reports (links and citations are available at the end of this document). While these limitations exist, the findings presented here provide managers at Cape Lookout National Seashore with an understanding of where various stakeholder groups' perceptions and preferences align and differ. Moreover, the research approach which used multi-stakeholder engagement can be transferred to other national park sites to enhance the robustness of future cultural resource climate adaptation planning processes to maximize the consideration of diverse stakeholder perspectives.

Continued stakeholder engagement studies will be necessary to determine how perceptions and preferences, including place meanings, change as climate change impacts are actualized. It will be important for the agency to establish longitudinal studies with various stakeholder types to enhance the understanding of stakeholder reactions to the implementation of adaptation strategies and stakeholders' responses to changing site conditions.

Implications

This report presents findings from multiple stakeholder studies (visitors, community members, members of partner organizations, and experts) regarding perceptions of place connections and climate change adaptation preferences. As findings both differed and coalesced between stakeholder groups, it seems important that managers seek input from multiple stakeholder groups prior to or during cultural resource climate adaptation planning. Efforts should be made to find commonly accepted adaptation strategies that will be least detrimental to place connections. When this is not possible, utilizing a spectrum of adaptation strategies could enhance overall acceptability of adaptation plans among diverse stakeholder groups.

Integrating place connections and adaptation preferences offers novel insights for climate adaptation planning. Most importantly, the disparate findings between stakeholder groups' place connections and their preferences for climate adaptation strategies will likely complicate planning efforts. While visitors had the weakest place connections, managers are often concerned about visitor satisfaction. The visitor study findings suggest that actively removing vulnerable buildings could reduce visitor satisfaction, as visitors prefer to see historic buildings on the landscape rather than read signs about buildings that once occupied the landscape. Conversely, community members' held strong place connections that were predominately intangible (e.g., the Cape Lookout Lighthouse being a symbol of "home"), and preferred that buildings not be moved or relocated as such actions would negatively impact their connections to the tangible resources on the landscape. Members of partner organizations held varying personal and family place connections but felt strongly about the importance of the park unit's uniqueness and the national significance of the historic buildings; as such, this stakeholder group most preferred preserving and interpreting these unique and nationally significant resources. This synthesis report illustrates that including measures of place connections can enhance managers' insights about not only which adaptation strategies are most preferred by groups but why these strategies or approaches meet each group's particular needs.

Managers should also consider that, while expert opinion can be considered to determine the 'best fit' adaptation strategy for a particular building, decisions should also be informed by the general preferences of visitors, partners, and community members. Specifically, the stakeholder groups included in this study would prefer to have things 'left as they are,' which is challenging for administrators and managers who know this is not possible in the dynamic barrier island ecosystem, especially as climate change impacts (e.g., sea level rise, storm surge) exacerbate flooding and erosion. Additional research is needed to determine the "window of opportunity" for continuing maintenance and the timeframe of impact for an adaptation strategy (including 'documenting and releasing') to be implemented (e.g., to stop maintaining within 5 or 10 years of likelihood of extensive damage to or inundation of a building). In the meantime, elevating a building may be the most commonly accepted adaptation strategy for retaining buildings on the landscape among Cape Lookout National Seashore stakeholders.

In the case of removing buildings or allowing them to deteriorate, interpretation will help communicate the necessity of these actions. Specificity in such interpretative signage, materials, or

guided walks may allow stakeholders to clearly understand how and why decisions are made by the NPS, which may enhance the acceptability of the implementation of specific adaptation strategies among park stakeholders. Additionally, digital documentation of buildings that is included in future interpretive materials will help preserve the cultural resource values of buildings that are selected for 'release.' Given the dynamic nature of the barrier islands at Cape Lookout National Seashore, as well as their vulnerability to climate change impacts from sea level rise and storm-related flooding and erosion (Peek et al., 2017), investment in substantial documentation efforts that not only ensure accurate and complete historic records of the buildings (e.g., historic structure reports) but also provide the opportunity for continued interaction and learning (e.g., immersive virtual tours; Addison, 2000) seems warranted.

When prioritizing buildings for adaptation (including documentation), all of the stakeholder groups perceive that the buildings that are the most nationally significant and central to the cultural landscape (e.g., the Cape Lookout Lighthouse) should be selected first. However, the importance of a building to a community of people should also be considered, as members of partner organizations considered this criterion to be very important and partner organizations may be able to leverage external resources to implement adaptation strategies. Additionally, our results suggest that national park managers will need on-site assistance by historic preservation experts to determine which structures hold the greatest scientific value, as this prioritization criterion was rated highly by both experts and members of partner organizations.

Conclusion

This report showcases and synthesizes key findings from four separate stakeholder studies that sought to document opinions about climate adaptation of the historic buildings at Cape Lookout National Seashore. True synthesis of findings is difficult as multiple data collection and analysis techniques were used. However, synthesizing stakeholder voices can highlight common and unique insights regarding managerial approaches for adapting cultural resources to climate change. The primary purpose of this report was to document and compare multiple stakeholder opinions, which illustrates that different stakeholders have varying connections to Cape Lookout National Seashore and varying adaptation preferences that relate to meanings the park holds for them, as well as highlights that adaptation priorities are relatively shared across groups. Future stakeholder outreach related to climate adaptation planning at Cape Lookout National Seashore can capitalize on these shared priorities to help build a common vision for the park's cultural resources.

A secondary purpose of this report was to demonstrate the utility of considering multiple stakeholder opinions for future cultural resource climate adaptation planning efforts. Multiple stakeholder studies allow managers to make more informed decisions based on the needs and wants of the publics they serve, the individuals with whom they collaborate, and the scientists studying the issues they manage. Documenting multiple stakeholder opinions also enables managers to better communicate to public audiences the diversity of vested interests and management preferences, which could enhance the acceptability of selected adaptation strategies and possibly initiate external fundraising efforts to enhance the implementation of adaptation actions. Additionally, comprehensive assessments can help identify knowledge gaps (e.g., the "window of opportunity" for continued investment in a historic building) and new innovations (e.g., extensive digital documentation that enables immersive virtual tours) that can enhance the preservation of the nation's cultural heritage given the inevitability of loss from climate change impacts.

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For Full Stakeholder Reports in this Series, see:

Fatorić, S., A. McCreary, and E. Seekamp. 2018. Informing Plans for Managing Resources of Cape Lookout National Seashore under Projected Climate Change, Sea Level Rise, and Associated Impacts: Experts Survey Report. Tourism Extension Report Series 2017-CALO-003. Department of Parks, Recreation and Tourism Management, College of Natural Resources, NC State University, Raleigh, NC.

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Appendix A: Visitor Introductory Script & Interview Guide

"Hello, my name is _____. I am a researcher from NC State University conducting a survey for the National Park Service. We would like to understand visitor experiences and opinions of the structures and cultural resources in [Portsmouth Village/Lookout Village], as well as thoughts about some strategies the park should take to address structures that are vulnerable to storms, hurricanes and rising sea levels. Your participation is voluntary and it will take about 15 minutes to answer our questions. We would like to audio record your responses now so that we can compile the responses later. We will not ask for your name or any other information that will personally identify you. Would you be willing to take part in the study?"

→ If YES – the Interviewer will ask, "have you or any member of your group already been asked to participate in this survey?"

→ If "YES" (previously agreed to participate) then, "Thank you for agreeing to participate in this study. We appreciate that you've already helped. Have a great day."

→ If "NO" (have not previously been asked but agrees to participate) then: the interview will provide the terms of the consent agreement as required by the N.C. State University as well as PRA and Privacy Act information.

"I would like to remind you that your participation is voluntary and that it should take about 15 minutes to complete a short interview about your visit and your opinions about the management of cultural resources here [SITE]. At any point you can request to end our conversation. I would like to record your responses. The recording will be assigned a code and will only be used to transcribe the interview - your name will not be associated and your responses will be completely anonymous. All responses in this study will be reported at the group level and not assigned to any specific individual. Once transcribed, I will permanently delete your audio file.

Ask: "for the purposes of the recording, do I have your verbal consent to audio record your responses?" The interviewer will begin with question #1 of the survey.

→ If NO– (soft refusal) then, "I won't bother you with the full interview, however, I hope you are willing to take just two minutes and answer a couple of questions for me now? I will write down your responses, which I will use to compare to the answers of people who completed the full interview. Are you willing to answer four brief questions?" [The interviewer will ask the following non-response bias questions]

NONRESPONSE BIAS QUESTIONS

1. What year was your first visit to Cape Lookout National Seashore?
2. What year was your first visit to [Portsmouth Village/Lookout Village]?
3. Please tell me how much you agree or disagree with the following statements:
    a. I feel like Cape Lookout National Seashore is a part of me.
        - ☐ Strongly Disagree
        - ☐ Disagree
        - ☐ Neither Agree nor Disagree
        - ☐ Agree
        - ☐ Strongly Agree
    b. Cape Lookout National Seashore is an important part of our history as a nation.
        - ☐ Strongly Disagree
        - ☐ Disagree
        - ☐ Neither Agree nor Disagree
        - ☐ Agree
        - ☐ Strongly Agree

→ **If NO** – (hard refusal) – "Thank you for your time. Have a great day."

FOLLOW INTRODUCTORY SCRIPT. IF PERSMISSION NOT GRANTED, ASK NON-RESPONSE BIAS CHECK QUESTIONS. IF PERSMISSION GRANTED, FOLLOW INTERVIEW GUIDE BELOW.

Is this your first visit to Cape Lookout? (If yes → Q3)?

What year was your first visit to Cape Lookout National Seashore?

How frequently do you typically visit Cape Lookout?

Including this visit, how many trips have you made to Cape Lookout?

When did you first visit [Cape Lookout Village or Portsmouth Village]?

How did you learn about visiting this site?

Including this visit, how many trip have you made to this site?

How frequently do you typically visit this site?

How did you learn about visiting Cape Lookout?

How did you get to Cape Lookout today? (personal boat; ferry)

Thinking about your trip today, what was your primary reason for visiting this site?

What other activities do you plan to participate in during this trip?

Looking at this map, what other areas within Cape Lookout National Seashore do you plan to visit during this trip?

(If previously visited CALO): what other areas have you previously visited?

(If intercepted at Lighthouse Complex): Are you aware that there are more historic structures, including an old Coast Guard Station, the Lookout Life-Saving Station, and several old vacation and fishing cabins, about 2 miles south of the lighthouse?

[If yes]: Have you visited that area before?

Will you visit today?

Why or why not?

Will you visit again in the future?

Why or why not?

[If no]: Do you plan on visiting that area today?

Why or why?

When you planned your trip, what were you expecting to see at this site?

How is your experience meeting or not meeting your expectations?

[If previously visited]: Are your expectations different from those you held from your first trip?

How are they different?

Have you noticed any changes since your first trip?

[If yes]: Please describe the changes you've noticed and how the changes have or have not changed your experience?

What do you think is special or unique about this site?

Was the area's history important to your visit?

[Probe]: Was any particular point in time of particular interest to you (such as the colonial period, federal maritime history, or civil war history)?

[If yes]: Which point in time and Why?

[Probe]: Was the area's natural history important to your visit?

[If yes]: Why?

[Probe]: Are any specific buildings of particular interest to you?

[If yes]: Provide map & ask to list which ones & describe why they are important.

Did you know that [Portsmouth Village/Cape Lookout Village] is designated as a National Historic District?

In general, do you think the site is well-maintained?

Why or why not?

Would you say it is generally in poor, fair, or good condition?

What improvements may have made your visit more enjoyable?

Did you know this site is managed by the National Park Service?

Because this site is located on a barrier island, are you aware that structures could be damaged from flooding from strong storms or gradual sea level rise?

If no → Unfortunately they are

If yes → That's good that you're aware.

Because of this potential for damage, the National Park Service is considering ways to protect the historic structures at this site, or determining if they should simply let nature take its course. Today we would like to know how either of these decisions might change your experiences here.

If vulnerable buildings were elevated, how would that change your experience of the Historic District?

If vulnerable buildings were moved to safer locations within the Historic District, how would that change your experience of the Historic District?

If vulnerable buildings were removed and information about the building were provided through interpretive signs were the buildings once stood, how would that change your experience of the Historic District?

If vulnerable buildings were destroyed by a storm, do you think the story of [Portsmouth Village/Cape Lookout Village] could be well told through interpretive signs placed throughout the District?

[If so]: How would that change your experience of the Historic District?

[If not]: Why not?

Would you still visit this site if there were fewer buildings?

[If yes]: How would that change your experience of the Historic District?

[If not]: Why not?

I will read five statements and I am going to ask you to rate your response on a scale between 1and 5—where 1 is strongly disagree, 2 is disagree, 3 is neither agree nor disagree, 4 is agree, and 5 is strongly agree (hand respondent a card with the scale written on it). After each statement please tell me the number that best represents how you feel.

Five statements about the buildings on site.

Statements	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
If vulnerable buildings were elevated, that would change my experience of the Historic District?	1	2	3	4	5
I feel the condition of the buildings at this site positively affected my visit.	1	2	3	4	5
If the buildings were better maintained I would enjoy my visit more.	1	2	3	4	5
If the buildings were more poorly maintained it would disappoint me.	1	2	3	4	5

Imagine that you were an NPS manager, and your job was to prioritize the preservation of the buildings within this site. Using the map tell me what you would do.

Which one(s) would you preserve and why? [record response for each building identified] OR

Would you try to preserve the entire Historic District? How would you do it?

Now, we would like to know about your personal connections to Cape Lookout National Seashore.
11. I will read six statements and I am going to ask you to rate your response on a scale between 1and 5—where 1 is strongly disagree, 2 is disagree, 3 is neither agree nor disagree, 4 is agree, and 5 is strongly agree (hand respondent a card with the scale written on it). After each statement please tell me the number that best represents how you feel.

Six statements about personal connections to Cape Lookout National Seashore.

Statements	**Strongly disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
I feel that Cape Lookout is an important part of our nation's history	**1**	**2**	**3**	**4**	**5**
I have a personal attachment to the history and culture here at Cape Lookout	**1**	**2**	**3**	**4**	**5**
There are important family memories tied to the history and culture associated with Cape Lookout	**1**	**2**	**3**	**4**	**5**
It is important that the historical and culture resources at Cape Lookout s preserved and protected is important for future generations.	**1**	**2**	**3**	**4**	**5**
I believe that the history and culture associated with Cape Lookout are unique and unlike others in the region.	**1**	**2**	**3**	**4**	**5**
I get more satisfaction from visiting Cape Lookout than from *other outer banks* historic/cultural sites	**1**	**2**	**3**	**4**	**5**

One last question, do you think you'll visit the village again in the future?

[if **YES**]: Why?

[if **NO**]: Why not?

Now I just have a few last questions that will better help us understand who participated in our study:

What is your home zip code (or city and country if not US resident)?

How many people are you traveling with?

Did they all accompany you to [Portsmouth Island/Lookout Village]?

[If not]: How many did not travel with you to this site and why did they chose not to visit?

In what year were you born?

Thank you for your time. We hope you enjoy the rest of your visit to Cape Lookout National Seashore

Appendix B: Community Member Interview Guide

The following questions will guide semi-structured interviews with key informants from individuals with access to community groups with associations/ties to Cape Lookout National Seashore (CALO). The questions are designed to be open-ended and for interviewers to follow-up at any time with questions such as, "Can you describe that in more detail?" "What did you mean when you said, xxx?" Additional probes for specific information are included below to elicit responses about specific subtopics if the subtopic did not arise during the initial response to the open-ended questions.

Paperwork Reduction and Privacy Act Statement: *The National Park Service is authorized by 54 USC 100702 to collect this information. This information will be used by park managers to understand the perceptions of partner organizations concerning the cultural resources of Cape Lookout National seashore. Responses to this request are voluntary and anonymous. Your name will never be associated with your answers, and all contact information will be destroyed when the data collection is concluded. No action may be taken against you for refusing to supply the information requested. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number and expiration date.*

BURDEN ESTIMATE STATEMENT*: Public reporting burden for this form is estimated to average 60 minutes per response. Direct comments regarding the burden estimate or any other aspect of this form to: pponds@nps.gov (email).*

INTERVIEW GUIDE

Thank you for agreeing to participate in an interview about the cultural resources at Cape Lookout National Seashore. The National Park Service contracted with NC State University because managers are concerned about the vulnerability of the historic buildings and cemeteries, particularly related to flooding, erosion and sea level rise. Specifically, managers would like to know more about the connections people have to Portsmouth and Lookout Villages and the types of changes to the Villages that have been observed overtime. They would also like to collect local insights on strategies for adapting to changing conditions.

I am particularly interested in knowing more about your connections to the historic buildings and cemeteries located within Portsmouth Village on Portsmouth Island and within Lookout Village near and including the Cape Lookout Lighthouse, as well as your thoughts on the cultural landscape. By cultural landscape, I mean not only the historic buildings and cemeteries, but also the surrounding land, plants, wildlife and water, including fish.

I am also interested in your family's and your community's connections to these cultural resources. When talking about your community's connection, I mean the people of the "Down East"

communities of North Carolina, as well as those in Beaufort and Moorhead City with ties these resources.

I'm also going to refer to Cape Lookout National Seashore as "Cape Lookout".

As I indicated when we scheduled this interview, this study is voluntary and you are free to stop the interview at any time. There are no known risks or benefits to you for participating in the study.

I'm going to start the audio recorder now and begin the interview. At the end of the interview, I will ask you to recommend other community members with strong ties to the villages that you think I should also interview.

Theme 1: Connections to Place

1. How many years have you lived in the "Down East" community?
2. Can you please describe your connection with Cape Lookout National Seashore?
    a. [Probe]: Do you have personal connections to the history or culture associated with Lookout Village or Portsmouth Island?
3. What meanings does Cape Lookout hold for your family?
4. What meanings does Cape Lookout hold for your community?
5. How frequently do you visit Cape Lookout?
    a. Where do you go?
6. What benefits does Cape Lookout provide to you?
7. What benefits does Cape Lookout provide to your family?
8. What benefits does Cape Lookout provide to your community?
9. Have you or anyone in your family taken any actions to preserve the cultural resources at Cape Lookout (including passing down oral history, fostering historic designation, fundraising, or volunteerism)?
    a. If so, what actions and what were the results?
        i. How has this affected your connections to Cape Lookout?
10. Have members of your community taken any actions to preserve the cultural resources at Cape Lookout?
    a. If so, what actions and what were the results?
        i. How has this affected your connections to Cape Lookout?

Theme 2: Perceptions of Cultural Resource Conditions

11. When you think about the cultural resources of Cape Lookout, what first comes to mind?
    a. How would you describe the condition of those cultural resources?

12. When you think about the cultural landscape of Cape Lookout, what do you picture?
    a. What components of the cultural landscape mean the most to you? Why?
13. How would you describe the conditions of the cultural resources at Lookout Village?
14. How would you describe the conditions of the cultural resources at Portsmouth Island?

Theme 3: Perceptions of Vulnerability, Change and Cultural Resource Management

15. In the past 5 or 10 years, have you seen any changes in the cultural resources or cultural landscape at Cape Lookout? Please explain.
    a. How have you seen the cultural resources or cultural landscape at Lookout Village change over time?
    b. How have you seen the cultural resources or cultural landscape at Portsmouth Village change over time?
16. Some people are concerned about the cultural and natural resources at Cape Lookout and their vulnerability to future threats. What is your perspective on the vulnerability of Cape Lookout to future threats?
    a. Would you describe the cultural resource or landscape as vulnerable? [Probe: If so, what makes the cultural and natural resources within the cultural landscape vulnerable?]
17. What are the greatest threats to the cultural resources at Lookout Village? [Probe: sea level rise, storm surge flooding and erosion]
    a. How will these threats impact cultural resources and the cultural landscape?
    b. How concerned are you about the threats you mentioned? [Probe: Why?]
18. What are the greatest threats to the cultural resources at Portsmouth Island? [Probe: sea level rise, storm surge flooding and erosion]
    a. How will these threats impact cultural resources and the cultural landscape?
    b. How concerned are you about the threats you mentioned? [Probe: Why?]
19. In your mind, what should be done to prevent the threats you've identified?
    a. If the threats you note are unavoidable, what strategies should be taken to adapt to the changes or impacts? (Provide examples, if needed, such as elevating buildings, documenting then removing buildings, and moving buildings.)

Theme 4: Visions for the Future

20. Would changes to the cultural landscape affect your connection to Cape Lookout?
    a. How?

21. Protecting historic buildings in changing environments, like barrier islands, is challenging. Do you have suggestions for managers on cultural resource management into the future?
    a. What buildings, resources or landscapes are most critical to preserving cultural heritage?
        i. Why?
22. Current policy of the NPS is to prioritize management based on the vulnerability and significance of particular resources. Do you have any advice for NPS managers in their prioritization of cultural resources? (Probe: In other words, how should the National Park Service determine which resources are most significant? What other criteria do you believe the Park Service should consider when making prioritization decisions?)
    a. Is the age of a building important when making management decisions?
        i. Why?
23. How would you characterize communication between the NPS and local communities?
    a. What's working?
    b. What's not working?

Appendix C: Partner Organization Questionnaire

OMB Control Number: Control Number: 1024-0278

Expiration Date: 10-31-2019

Cape Lookout National Seashore Cultural Resource Values and Vulnerabilities Assessment

Online Survey Questionnaire for Partner Organizations

SURVEY INSTRUMENT

-PAGE 1-

Thank you for taking the time to help us today!

We are interested in understanding:

Your connections to and values of the historic villages;

Your thoughts on the conditions of the resources and how vulnerable you think they are to rising sea levels, erosion from storm related flooding, wind damage from storms);

The extent of changes you've noticed and how those changes impact your attachment to the villages; and

Your perspective on possible strategies to address changes.

Participation in the study is voluntary and your name and email address will not be linked to your responses. It should take you about 15 minutes to respond to the survey.

Paperwork Reduction and Privacy Act Statement: *The National Park Service is authorized by 54 USC 100702 to collect this information. This information will be used by park managers to understand the perceptions of partner organizations concerning the cultural resources of Cape Lookout National seashore. Responses to this request are voluntary and anonymous. Your name will never be associated with your answers, and all contact information will be destroyed when the data collection is concluded. No action may be taken against you for refusing to supply the information requested. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.*

BURDEN ESTIMATE STATEMENT*: Public reporting burden for this collection is estimated to average 15 minutes per response. This estimate includes the initial contact and introduction as well as the time to complete the survey questions. Please direct comments regarding the burden estimate or any other aspect of this form to: Phadrea D Ponds at pponds@nps.gov (email).*

SECTION 1: Place Connections

1. We are interested in knowing more about local connections to Cape Lookout National Seashore ("Cape Lookout"). ***Please mark only one response for each item.***

Question 1 response table

Please indicate your level of agreement or disagreement with each of the statements.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I feel Cape Lookout is a part of me.	1	2	3	4	5
I identify strongly with Cape Lookout.	1	2	3	4	5
What happens at Cape Lookout doesn't matter to me.	1	2	3	4	5
No other place can compare to Cape Lookout.	1	2	3	4	5
Few people know Cape Lookout like I do.	1	2	3	4	5
My family's income or livelihood depends on Cape Lookout.	1	2	3	4	5
Many important family memories are tied to Cape Lookout.	1	2	3	4	5
Local communities' history is strongly tied to Cape Lookout.	1	2	3	4	5
The local economy depends on Cape Lookout.	1	2	3	4	5
Cape Lookout is an important part of our history as a nation.	1	2	3	4	5
Preserving the history and culture associated with cultural resources at Cape Lookout is important for future generations.	1	2	3	4	5

2. We are interested in knowing more about your connections to Cape Lookout National Seashore's cultural resources. Please indicate the extent to which you agree or disagree with the following statements about the history and culture associated with Cape Lookout. *Please mark only one response for each item.*

Question 2 response table

The history and culture associated with Cape Lookout…	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
…contributes to the character of local communities.	1	2	3	4	5
…contributes to the uniqueness of local communities.	1	2	3	4	5
…provides me with a sense of pride in my heritage.	1	2	3	4	5
…makes it a special place for my family.	1	2	3	4	5
…attracts tourism dollars to local communities.	1	2	3	4	5
…contributes to a more stable local economy.	1	2	3	4	5
…creates a stronger sense of community togetherness.	1	2	3	4	5
…provides a sense of family bonds within local communities.	1	2	3	4	5
…provides feelings of community pride.	1	2	3	4	5
…is unique and unlike other historic barrier island communities in the region.	1	2	3	4	5

SECTION 2. Cultural Resource Values

We would like to know what values you think are important about the cultural resources at Cape Lookout.

3. Please use the mouse to rank the following cultural resource values in order of importance. Drag the value that is most important to you to the top of the list, then move the second most important value below the first, and continue until the least important value is located at the bottom of the list.

- Aesthetics (visual quality of heritage).
- Spiritual values (spiritual inspiration, religious experiences, awe).
- Social values (gatherings to honor heritage, cultural practices and customs).
- Historical connections (maritime commerce, coast guard station).
- Authenticity (genuine, original characteristics).
- Bequest value (future generations).

4. We are interested in understanding your perceptions of the importance of some of the following attributes of Cape Lookout National Seashore. Please mark only one response for each item.

Question 4 response table

How important are the following resources and values at Cape Lookout?	Not at all important	Slightly important	Somewhat important	Very important	Extremely important
Undeveloped character with limited facilities.	1	2	3	4	5
Recreational opportunities and experiences in a remote setting.	1	2	3	4	5
A natural laboratory to study how barrier islands change over time.	1	2	3	4	5
Human connection to the outer banks.	1	2	3	4	5
Archaeological sites.	1	2	3	4	5
Barrier island geology and ecology.	1	2	3	4	5
Cultural landscape (the collection of historic buildings, cemeteries, and the surrounding land, plants, wildlife and water, including fish).	1	2	3	4	5
The history of people and commerce at the edge of the sea (maritime livelihoods).	1	2	3	4	5
Educational opportunities and interpretive signage.	1	2	3	4	5
Lighthouse and other federal maritime structures.	1	2	3	4	5
Historic community buildings (church, school house, post office).	1	2	3	4	5
Historic residential buildings.	1	2	3	4	5

SECTION 3. Cultural Resource Conditions/Vulnerabilities

Due to changes, particularly sea level rise and storm-related flooding, the National Park Service will need to adopt adaptive strategies for management at Cape Lookout. One key element in making adaptation strategies is related to the vulnerability of the resources. We are interested in your perceptions of the cultural resource conditions and vulnerability at Cape Lookout.

5. We are interested in knowing how you would rate the overall condition of the following cultural resources at Cape Lookout. *Please mark only one response for each item.*

Question 5 response table

Responses	Poor	Fair	Average	Good	Excellent
All of the cultural resources at Cape Lookout National Seashore.	1	2	3	4	5
The Lighthouse and Keepers Quarters at the north end of Cape Lookout Village.	1	2	3	4	5
The remaining historic structures within Cape Lookout Village (not including the lighthouse and keepers quarters).	1	2	3	4	5
The historic structures at Portsmouth Village.	1	2	3	4	5

6. In general, how vulnerable do you believe Cape Lookout is to barrier island system changes from storm-related flooding and erosion?

- ☐ Not at all vulnerable
- ☐ Slightly vulnerable
- ☐ Somewhat vulnerable
- ☐ Very vulnerable
- ☐ Extremely vulnerable

7. In general, how vulnerable do you believe Cape Lookout is to barrier island system changes from sea level rise?

- ☐ Not at all vulnerable
- ☐ Slightly vulnerable
- ☐ Somewhat vulnerable
- ☐ Very vulnerable
- ☐ Extremely vulnerable

8. How vulnerable do you believe the cultural resources within the historic districts are to the following threats? *Please mark only one response for each item.*

Question 8 response table

Threats	Not at all vulnerable	Slightly vulnerable	Somewhat vulnerable	Very vulnerable	Extremely vulnerable
Submersion (structures will be permanently submerged in water from sea level rise).	1	2	3	4	5
Erosion (structures will be damaged from the loss of stabilizing soil related to sea level rise and/or storm surges).	1	2	3	4	5
Inundation (structures will be periodically flooded from sea level rise and/or storm surges).	1	2	3	4	5
Saturation (structures will be on wet ground due to rising water tables associated with sea level rise).	1	2	3	4	5
Deterioration (structure will fall apart from precipitation, temperature, wind variation).	1	2	3	4	5
Destruction (structure will be completely lost from flooding and storms).	1	2	3	4	5
Increased fire risk (structures fire risk can increase from increased rot, insect infestations, or nearby forest fuels).	1	2	3	4	5
Invasion (invasive species and mold will decrease the strength/integrity of the structure).	1	2	3	4	5
Disruption (loss of access to Village because of damage to docks).	1	2	3	4	5
Degradation (loss of access to structures from vandalism and looting).	1	2	3	4	5

SECTION 4. Perceptions of Change and Impacts to Values/Meanings

We are interested in understanding the types of changes you may have noticed at Cape Lookout, particularly to the cultural landscape (historic buildings, cemeteries, and the surrounding land, plants, wildlife and water, including fish).

9. In what year did you first visit Cape Lookout? _____

(*Write in year*)

10. In what year did you last visit Cape Lookout? _____

(*Write in year*)

11. Have you noticed changes in the cultural landscape at Cape Lookout since your first visit?
Please mark only one response.

☐ Yes

☐ No → Go to Q12

If yes, please describe the changes in a few words.

12. How would you rate the extent to which the following have changed since your first visit?
Please mark only one response for each item.

Question 12 response table

Park Feature	No Change	Minimal Change	Moderate Change	Major Change	Severe Change
The barrier islands of Cape Lookout.	1	2	3	4	5
The landscape of Cape Lookout Village.	1	2	3	4	5
The Lighthouse and Keepers Quarters at Lookout Village.	1	2	3	4	5
The historic structures of Cape Lookout Village (excluding the lighthouse and keepers quarters).	1	2	3	4	5
The landscape of Portsmouth Village.	1	2	3	4	5
The historic structures of Lookout Village.	1	2	3	4	5

13. How have the changes to the cultural landscape at Cape Lookout National Seashore affected the extent to which you feel connected to the following resources? *Please mark only one response for each item.*

Question 13 response table

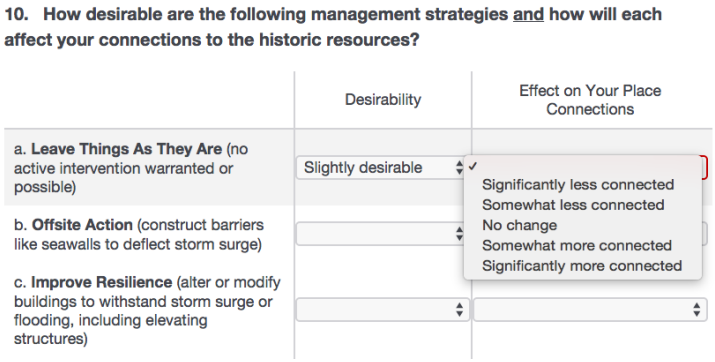
Park Feature	Significantly less connected	Somewhat less connected	No change	Somewhat more connected	Significantly more connected
Cape Lookout National Seashore in general.	1	2	3	4	5
The Lighthouse and Keepers Quarters at Cape Lookout Village.	1	2	3	4	5
The historic structures of Cape Lookout Village (excluding the lighthouse and keepers quarters).	1	2	3	4	5
The landscape of Portsmouth Village.	1	2	3	4	5
The historic structures of Portsmouth Village.	1	2	3	4	5

SECTION 5. Cultural Resource Management Strategies

The National Park Service is currently developing possible strategies to adapt cultural resources to changes from sea-level rise and storm-related flooding and erosion. We would like to know your thoughts on the following strategies for the cultural resources located at Cape Lookout National Seashore.

14. This question requires two responses. First we would like for you to read each management scenario. Then we would like to know: 1) the level of desirability you have for each strategy and 2) how your level of connection to the historic resources would be affected by the strategy?
Please mark one response in each category for each strategy.

NOTE: In the electronic version of the questionnaire, the respondent will be asked to read each strategy and respond in terms of desirability and effect on place. Choices about desirability and effects on place connections are in reference to lettered management strategies on the left. Response categories for each question (desirability & effects on place connections) will be presented in dropdown menus and are independent questions. See image below.



Question 14 response table

Scenario	Desirability	Effect on your Place Connections
Leave things as they are (if preservation treatments are too technically challenging or expensive, take no action and allow building to deteriorate as change occurs).	☐ Not at all desirable ☐ Slightly desirable ☐ Somewhat desirable ☐ Very desirable ☐ Extremely desirable	☐ Significantly less connected ☐ Somewhat less connected ☐ No change ☐ Somewhat more connected ☐ Significantly more connected
Take offsite action (construct barriers like seawalls to deflect storm surge).	☐ Not at all desirable ☐ Slightly desirable ☐ Somewhat desirable ☐ Very desirable ☐ Extremely desirable	☐ Significantly less connected ☐ Somewhat less connected ☐ No change ☐ Somewhat more connected ☐ Significantly more connected

Question 14 response table

Scenario	Desirability	Effect on your Place Connections
Improve resilience (alter or modify buildings to withstand storm surge or flooding, including elevating structures).	☐ Not at all desirable ☐ Slightly desirable ☐ Somewhat desirable ☐ Very desirable ☐ Extremely desirable	☐ Significantly less connected ☐ Somewhat less connected ☐ No change ☐ Somewhat more connected ☐ Significantly more connected
Manage change (plant vegetation to reduce erosion or build boardwalks to access buildings).	☐ Not at all desirable ☐ Slightly desirable ☐ Somewhat desirable ☐ Very desirable ☐ Extremely desirable	☐ Significantly less connected ☐ Somewhat less connected ☐ No change ☐ Somewhat more connected ☐ Significantly more connected
Relocate (move buildings to a less vulnerable location).	☐ Not at all desirable ☐ Slightly desirable ☐ Somewhat desirable ☐ Very desirable ☐ Extremely desirable	☐ Significantly less connected ☐ Somewhat less connected ☐ No change ☐ Somewhat more connected ☐ Significantly more connected
Document and release (study and record the details of the buildings, and then allow them to deteriorate with storms and flooding).	☐ Not at all desirable ☐ Slightly desirable ☐ Somewhat desirable ☐ Very desirable ☐ Extremely desirable	☐ Significantly less connected ☐ Somewhat less connected ☐ No change ☐ Somewhat more connected ☐ Significantly more connected
Interpret the change (talk with visitors or provide signs with information about how storms, flooding, erosion and sea level rise are changing the resources).	☐ Not at all desirable ☐ Slightly desirable ☐ Somewhat desirable ☐ Very desirable ☐ Extremely desirable	☐ Significantly less connected ☐ Somewhat less connected ☐ No change ☐ Somewhat more connected ☐ Significantly more connected

15. If a structure was moved from its original location within one of the Villages, how would that impact the meanings the Village holds for you? *Please mark only one response.*

- ☐ Significantly detract
- ☐ Slightly detract
- ☐ No change
- ☐ Slightly enhance
- ☐ Significantly enhance

SECTION 6. Resource Prioritization

Strategies are needed to adapt the cultural resources at Cape Lookout to changes from sea-level rise and storm-related flooding and erosion. We are interested in learning about your perceptions of what are the most important things about a historic structure that decision-makers should consider when prioritizing future actions.

16. How important are the following considerations in prioritizing adaptation of historic structures? *Please mark only one response for each item.*

Question 16 response table

How important is it that prioritization be placed on structures that …	Not at all important	Slightly important	Somewhat important	Very important	Extremely important
have been restored previously.	1	2	3	4	5
are the least expensive structures to restore.	1	2	3	4	5
are the least expensive structures to maintain in the future.	1	2	3	4	5
are meaningful to a few people (e.g., a family).	1	2	3	4	5
are meaningful to a community of people.	1	2	3	4	5
are most visited by the public.	1	2	3	4	5
have the highest scientific value (help us to better understand aspects of the past).	1	2	3	4	5
hold particular historical value because of its uniqueness (e.g., only one like it).	1	2	3	4	5
symbolize something of national importance.	1	2	3	4	5

17. "How important is it that prioritization be placed on the total cost of the restoration project?"

- ☐ Not at all vulnerable
- ☐ Slightly vulnerable
- ☐ Somewhat vulnerable
- ☐ Very vulnerable
- ☐ Extremely vulnerable

SECTION 7. Demographics

The following questions will help us better understand your connections to this place and contextualize our findings. These data are for descriptive purposes and will not be used to weight your answers to any of the previous questions.

18. In what year were you born? _____

(Write in year)

19. How frequently do you visit Cape Lookout?

- ☐ Irregularly (less than annually)
- ☐ Annually
- ☐ Twice a year
- ☐ 3 to 5 times a year
- ☐ 6 to 8 times a year
- ☐ 8 to 10 times a year
- ☐ More than 10 times a year

20. Which of the historic districts do you most frequently visit?

- ☐ Portsmouth Village
- ☐ Lookout Village
- ☐ Both Equally

21. Have you had any ownership of structures (including leases) at either Portsmouth Island or Lookout Village?

- ☐ No
- ☐ Yes → In what year did you last occupy the structure? _____

  (*Write in Year*)
- ☐ Not me but my relatives → In what year did your family last occupy the structure? _____

  (*Write in Year*)

22. What is your primary zip code? _____

(*Write in Zip Code*)

a. If you have a secondary address near CALO, what is that zip code? _____

(*Write in Zip Code*)

23. What is your gender?

- ☐ Male
- ☐ Female
- ☐ Prefer not to say

We thank you for your time spent taking this survey.

Your responses have been recorded.

Appendix D: Expert Questionnaire

*Example with one of the randomly selected buildings to evaluate

Cape Lookout National Seashore Cultural Resource Values and Vulnerabilities Assessment

Expert Survey

SURVEY INSTRUMENT

Thank you for taking the time to help us!

We are interested in understanding your thoughts about:

- Practice and policy challenges to cultural resource management and historic preservation in changing coastal areas;
- Strategies to overcome those challenges, including training and policy tool needs; and
- Criteria that could be used to prioritize cultural resources in decision-making.

We are also interested in assessing the adaptation strategies you would recommend for specific cultural resources at Cape Lookout National Seashore, as well as how you would rate those resources in terms of their significance and vulnerability to sea level rise and storm-surge flooding. We will collect these adaptation recommendations using a participatory web-mapping decision support tool that you will access via a link contained within this survey.

Participation in the study is voluntary and your name and email address will not be linked to your responses. It should take you about 45 minutes to respond to the survey.

Paperwork Reduction and Privacy Act Statement: *The National Park Service is authorized by 54 USC 100702 to collect this information. This information will be used by park managers to understand the perceptions of partner organizations concerning the cultural resources of Cape Lookout National seashore. Responses to this request are voluntary and anonymous. Your name will never be associated with your answers, and all contact information will be destroyed when the data collection is concluded. No action may be taken against you for refusing to supply the information requested. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number*.

BURDEN ESTIMATE STATEMENT*: The public reporting burden for this collection is estimated to be 45 minutes per response. Direct comments regarding the burden estimate or any other aspect of this form to: Phadrea D Ponds at pponds@nps.gov (email).*

Section 1: Background and Experience

The questions in this section will help us to identify the type of employment, diversity of experience, and geographic region of resources of our respondents.

We would like to know a little about you.

1. Which of the following categories best describes the organization for which you currently work? *Please select only one response.*

- ☐ Federal government agency
- ☐ State government agency
- ☐ Local government agency
- ☐ Historic preservation organization
- ☐ Private contractor or consultant
- ☐ Academic institution

2. Please list the three primary duties you perform related to cultural resource management, with the estimated percentage of effort/time for each duty.

Duty _____ % of effort _____

Duty _____ % of effort _____

Duty _____ % of effort _____

3. How many years have you worked in your current position?

Number of Years _____

4. How many years have you been employed by your current agency/organization?

Number of Years _____

5. Please indicate the type of cultural resource management (CRM) or historic preservation experience, such as a government position, environmental consultant, or academic/research, and the number of years employed.

- ☐ Federal Government Number of Years _____
- ☐ State Government Number of Years _____
- ☐ Local Government Number of Years _____
- ☐ Tribal Government Number of Years _____
- ☐ Consultant Number of Years _____
- ☐ University/Academic or Research Number of Years _____
- ☐ Other _____ Number of Years _____

6. Which region best describes where you conduct your CRM or historic preservation work?
Check all that apply.

- ☐ North Atlantic US (ME, NH, VT, MA, RI, CT, NY)
- ☐ Mid Atlantic US (NJ, DE, MD, VA, DC)
- ☐ South Atlantic US (NC, SC, GA)
- ☐ Gulf Coast US (FL, AL, MS, LA, AR, TX)
- ☐ Caribbean US (PR, VI)
- ☐ Great Lakes States US (PA, MI, WI, MN, IL, IN, OH)
- ☐ Central US (noncoastal) (WV, TN, KY, OK, MO, KS, ND, SD, NE, IA)
- ☐ Rocky Mountain US (noncoastal) (MT, ID, WY, UT, CO)
- ☐ Southwest US (noncoastal) (AZ, NM, NV)
- ☐ Pacific Northwest US (OR, WA, AK)
- ☐ California US (CA)
- ☐ Pacific Islands US (HI, GU)
- ☐ International (Non-US)

Section 2: Landscape and Ecosystem Change and Cultural Resource Management

We are interested in understanding important cultural resource management challenges presented by a coastal environment and identifying strategies and information needs to overcome those challenges.

7. How do sea level rise and stronger or more frequent storms **challenge** current historic preservation and cultural resource management guidelines and frameworks? *Please list up to three **greatest policy challenges***.

CRM Policy Challenge 1: [open-end text box]

CRM Policy Challenge 2: [open-end text box]

CRM Policy Challenge 3: [open-end text box]

8. How do sea level rise and stronger more frequent storms **challenge** current historic preservation and cultural resource management practices? *Please list up to three **greatest practice challenges***.

CRM Practice Challenge 1: [open-end text box]

CRM Practice Challenge 2: [open-end text box]

CRM Practice Challenge 3: [open-end text box]

9. When considering the challenges you listed, in your opinion what **strategies** can help preserve cultural resources vulnerable to increases in coastal flooding and storm surge related impacts? *Please list up to three **strategies.***

Strategy 1: [open-end text box]

Strategy 2: [open-end text box]

Strategy 3: [open-end text box]

10. What information, training, or guidance would you need in the next five years to overcome the challenges or implement the strategies you listed? *Please list up to three most important **needs** you have.*

Need 1: [open-end text box]

Need 2: [open-end text box]

Need 3: [open-end text box]

Section 3. Resource Prioritization

Strategies are needed to adapt cultural resources in dynamic, changing landscapes. We are interested in learning about your perceptions of how to prioritize historically designated buildings.

11. How important are the following considerations in prioritizing historically designated buildings for adaptation planning on a 30-year time horizon? *Please select one response for each item.*

Question 11 response table

How important is it that prioritization be placed on structures that…	Not at all important	Slightly important	Somewhat important	Very important	Extremely important
previously had a preservation treatment applied to it.	1	2	3	4	5
have the least expensive preservation treatment(s).	1	2	3	4	5
are the least expensive to maintain in the future.	1	2	3	4	5
are meaningful to only a few people (e.g., a family).	1	2	3	4	5
are meaningful to a community of people.	1	2	3	4	5
provide significant tourism revenue to local communities.	1	2	3	4	5
are the most visited by the public.	1	2	3	4	5
have the highest scientific value (helps us better understand aspects of the past).	1	2	3	4	5
hold particular historical value because its uniqueness (e.g., only one like it; singularity).	1	2	3	4	5
symbolize something of national importance.	1	2	3	4	5

Question 11 response table (continued)

How important is it that prioritization be placed on structures that…	Not at all important	Slightly important	Somewhat important	Very important	Extremely important
serve a programmatic function to a National Park site (e.g., a contributing factor to the designation of the site or listed as a foundational resource).	1	2	3	4	5
hold the highest interpretive potential to a National Park site (e.g., link to the site's interpretive plan).	1	2	3	4	5
represent the foundation of a community (e.g., is the reason other structures were built).	1	2	3	4	5
play a central role in the cultural landscape (e.g., prominent).	1	2	3	4	5
hold an operational purpose (e.g., the structure currently serves as a visitor center).	1	2	3	4	5
are most vulnerable to sea level rise (severity of risk)	1	2	3	4	5
are most vulnerable to storm-related flooding and erosion (severity of risk).	1	2	3	4	5
will have the most immediate sea level rise impacts (urgency of action).	1	2	3	4	5
will have the most immediate storm-related flooding and erosion impacts (urgency of action).	1	2	3	4	5
are the most vulnerable due to deferred maintenance.	1	2	3	4	5
Other: [write in]	1	2	3	4	5
Other: [write in]	1	2	3	4	5

Section 4. Evaluating Vulnerability, Significance and Recommending Adaptation Strategies at Cape Lookout National Seashore

In this section, you will be presented with a brief description of the cultural resources within two designated historic districts (Portsmouth Village and Cape Lookout Village) at Cape Lookout National Seashore. After you read the descriptions, you will be asked to click on a hyperlink that will direct you to the next segment of the survey. You will use an interactive visualization tool to rate the significance and vulnerability of 5 historic structures. After that, you will be asked to evaluate the probability of success for each the following adaptation strategies using your best judgment as a cultural resource or historic preservation expert.

- **Leave things as they are** (if preservation treatments are too technically challenging or expensive, take no action and allow building to deteriorate as change occurs).

- **Take offsite action** (construct barriers like seawalls to deflect storm surge).
- **Improve resilience** (alter or modify buildings to withstand storm surge or flooding, including elevating structures).
- **Manage change** (plant vegetation to reduce erosion or build boardwalks to access buildings).
- **Relocate** (actively relocate structure to a less vulnerable location).
- **Document and release** (study and record the details of the buildings and cemeteries, and then allow them to deteriorate with storms and flooding).

It is important to keep in mind that the ability to apply all of the adaptation actions (except for "Leave things as they are") would require financial resources external to the park's annual operating budget, such as private donations or competitive funding. We are asking you to assess only the probability of success of the treatment in reducing the vulnerability of the structure and *not* the probability of success in securing additional funding for the treatment.

NOTE to Reviewers: The respondents will be asked to view five different structures (similar to the screen shot below). They will receive information about the history of the structure prior to reviewing (as cultural resource and historic preservation experts, they will want to know about the structure prior to making judgments about suggested adaptation actions). The visualization tool will allow the respondent to manipulate the images using activating GIS layers developed from the Sea Level Affecting Marshes Model (SLAMM) dataset.

Background Information

The National Park Service (NPS) is currently identifying adaptation strategies for cultural resources that are threatened by the influences of a coastal ecosystem. According to the National Historic Preservation Act, federal agencies with cultural resources that are designated on the National Register of Historic Places must "seek ways to avoid, minimize or mitigate" any adverse effects on historic properties. Further, the NPS must take into account the significance and vulnerability of cultural resources when planning for coastal flooding and storm surge (Policy Memorandum 14-02).

Cape Lookout National Seashore has numerous historic structures that were designated through district-level listings (Portsmouth Village and Cape Lookout Village). The arrangement of structures within the cultural landscape is such that not all structures are in their original locations and they represent different historic periods; however, the federal maritime era is the only history explicitly specified within the park's foundation document. Most structures within Portsmouth Village and a few within Lookout Village are vulnerable to sea level rise and storm-related flooding and erosion. During this exercise, you will be able to view sea level rise simulations.

It is important to keep in mind that the sea level rise projections are simplistic "bathtub" models that do not account for any geological changes that could occur from storms, including hurricanes and nor'easters. Instead, the models assume that current elevation remains constant, such that low lying areas are submerged as sea level increases. Therefore, these models have limitations and are only meant to illustrate one possible type of vulnerability so that you can consider possible adaptation strategies for dealing with sea level rise.

Many of the historic structures within Portsmouth Village have received substantial preservation treatments, contain interpretive signs and replicas, and are open for public visitation (including a Visitor Center). Structures include a Life Saving Station, a church, a general store, and numerous formerly private residences, which represent different historic periods (colonization, civil war, post-depression). Descendants of former residents have organized the Friends of Portsmouth Island and gather every two years in the Village.

Lookout Village includes three separate sections: (1) the Lighthouse and Keepers Quarters; (2) the historic village complex (a Coast Guard Station, Life Saving Station, and small cabins); and (3) outlying structures (formerly private residences). The historic structures within Lookout Village, with the exception of the Lighthouse and Keepers Quarters, are in poor condition (have not been treated beyond stabilizing) and are not open to the public; there is no interpretation except for the Visitor Center within the Keepers Quarters, and the Lighthouse is open to the public between May and September.

Instructions

We recommend that you print this page to have as a reference when completing the next stage of the survey. Once you click on the hyperlink to the visualization portion of the survey, your answers to the previous parts of the survey will be submitted.

Once you click on the hyperlink below, a map will appear.

The map shows an aerial view of the landscape. National Seashore. You can zoom in and out of this view by clicking on the + and - buttons in the top left corner of the map. You can move about the map by clicking and holding the left button of your mouse then dragging the image.

You will notice red dots at the north (Portsmouth Village) and south (Lookout Village) ends of Cape Lookout National Seashore. You can zoom in and out of this view by clicking on the + and - buttons in the top left corner of the map. You can move about the map by clicking and holding the left button of your mouse then dragging the image.

You will notice red dots on the map. Each red dot indicates an area where a 360-degree image was taken. The dots are numbered and labeled and you can scroll through the list of images on far left side of window (you will see up and down arrows and white & gray dots; each dot is an image; the home button will bring you back to the full view of Cape Lookout National Seashore).

The image rotates so that you can see the resource in the landscape. You can zoom in on the image to look closer at the resource or other elements in the cultural landscape of the village.

Under each image there are two different sea level rise projections (Moderate, which uses the A1B climate scenario, & High, which uses the A1F1 climate scenario).

You can view the current sea level by clicking on the year 2014, then view future sea levels by

clicking on the years 2025, 2050, 2075, and 2100. Alternatively, you can view the changes by clicking on the slideshow link, which will slowly advance through the progression of sea level rise automatically.

Please click on this link to access the decision support tool (it will open in a new window; depending on your browser, however, you may need to right click and select "open in new window").

Structure 1: the Methodist Church in Portsmouth Village
The first resource we would like you to consider is the Methodist Church on Portsmouth Island. You can view the exterior of the structure with images 1, 2 & 4, and the interior of the structure with image 22.

Information about the Church:
The original Methodist Church, established at Portsmouth Village in 1840, was destroyed by a hurricane in 1899. It was rebuilt in 1901, but was destroyed by another hurricane in 1913 (along with a second church on the island; only the Methodist Church was rebuilt again (in 1915). With the help of the Methodist Conference, much of the time and money spent on rebuilding the church came from the residents of Portsmouth. The community cared about their place of worship and came together to collectively rebuild the church that was the center of most social events on the island. The church held regular services and Sunday school through the 1950s. The end of World War II and the opening of Hatteras Inlet led to the gradual and steady decline of Portsmouth as a maritime port, and church services were eventually discontinued as the island's population dwindled.

The current building features Gothic Revival-style elements and was assessed in 'fair' condition in 2006 due to a leaning foundation and brick piers in need of repair. Hurricane Sandy (2012) further damaged the structure (leaning and weakness in walls), closing it to the public. In 2013, funding as part of the Hurricane Sandy recovery effort was used to stabilize and straighten the church. The preservation work was performed by the National Park Service Historic Preservation Training Center.

The church is furnished with many original elements including the pews, pulpit, and organ; no additional exhibits were added during the 2009 exhibit plan to not intrude on its historic character or conflict with the religious significance of the church. A partner organization, Friends of Portsmouth Island, uses volunteers to regularly clean the inside and holds regular "homecoming" events at the church (hosted every two years); the church has also been used occasionally for baptisms and weddings.

Consider a 30-year planning horizon when answering the following questions, keeping in mind that some impacts from sea level rise will occur past that time period. *Please select one response for each item.*

12. How IMPORTANT is this resource to each of the following:

a. National Heritage

- ☐ Not at all important
- ☐ Slightly important
- ☐ Moderately important
- ☐ Very important
- ☐ Extremely important

b. Local Communities

- ☐ Not at all important
- ☐ Slightly important
- ☐ Moderately important
- ☐ Very important
- ☐ Extremely important

13. How VULNERABLE is this resource to Sea Level Rise?

- ☐ Very low vulnerability
- ☐ Low vulnerability
- ☐ Moderate vulnerability
- ☐ High vulnerability
- ☐ Very high vulnerability

14. How CONFIDENT are you in your vulnerability rating?

- ☐ Not at all confident
- ☐ Not very confident
- ☐ Fairly confident
- ☐ Very confident

15. What is the PRIORITY of taking action to maintain this resource?

- ☐ Very low priority
- ☐ Low priority
- ☐ Moderate Priority
- ☐ High priority
- ☐ Very high priority

16. What do you believe would be the probability of success for each of the following ADAPTATION STRATEGIES?

Question 16 response table

Strategy	Very low probability (<20%)	Low probability (21 - 40%)	Moderate probability (41- 60%)	High probability (61-80%)	Very high probability (>80%)
Leave things as they are	1	2	3	4	5
Take offsite action	1	2	3	4	5
Improve resilience	1	2	3	4	5
Manage change	1	2	3	4	5
Relocate	1	2	3	4	5
Document and release	1	2	3	4	5

17. To what extent will this strategy AFFECT THE CULTURAL LANDSCAPE of the historic district?

Question 17 response table

Strategy	Substantially detract	Slightly detract	No change	Slightly enhance	Substantially enhance
Leave things as they are	1	2	3	4	5
Take offsite action	1	2	3	4	5
Improve resilience	1	2	3	4	5
Manage change	1	2	3	4	5
Relocate	1	2	3	4	5
Document and release	1	2	3	4	5

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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