



Master Plan Perspectives

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The Linda Loring Nature Foundation

Master Plan Perspectives

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Abstract

The Linda Loring Nature Foundation is undergoing the development of a master plan. The goal of this project was to evaluate the draft master plan and prioritize actions based on stakeholder and community opinion. We implemented a survey to solicit general and targeted responses from various user groups and conducted interviews with stakeholders to solicit supplemental opinions and insights. We make several recommendations regarding actions the LLNF should pursue, prioritized according to the survey and interview responses. We suggest additional improvements regarding accessibility, community engagement and outreach, property maintenance, and interpretive materials as well as refinements for new educational and research programs.

Acknowledgments

We would like to thank everyone who contributed to our project and helped us along the way.

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- A Senior LLNF Board Member
- RJ Turcotte
- Matt Liddle
- Isaac Hersh
- Mickey Rowland
- Brenda McDonough
- Rachael Freeman

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ReMain Nantucket for welcoming us on to Nantucket and engaging us with the local community and businesses.

Executive Summary

Introduction

Fearing open spaces would be threatened by the burgeoning tourist economy and associated housing development, a group of concerned citizens in Nantucket began forming conservation groups in the 1960s. Since then, more than ten land conservation groups have organized to protect the island's natural resources. The Linda Loring Nature Foundation (LLNF) owns and manages a wildlife sanctuary comprising 275 acres on the western end of the island between Eel Point Road in the north and Madaket Road to the south. Today, the property encompasses a wide range of habitats including sandplain grassland, heathland, shrub swamp, woodlands, and vernal pools. The LLNF mission focuses on land stewardship, education, and research. With the recent addition of 167.41 acres of adjacent land following Linda Loring's passing in 2019, the Foundation is in the process of reassessing its mission and developing a new master plan for their property.

Mission and Objectives

The overall goal of this project was to assess the Linda Loring Nature Foundation Draft Master Plan from the perspective of stakeholders and community groups to prioritize actions that ensure future support and interest. In order to achieve this goal, we identified the following objectives:

- 1.) Assess how LLNF currently implements its strategic goals of stewardship, education, and research through its various programs and activities.
- 2.) Solicit stakeholder opinions in relation to the purpose, content, and future implementation of the LLNF draft master plan.
- 3.) Identify how different organizations operate in their role of environmental conservation and preservation on Nantucket.
- 4.) Review the content, structure, and purpose of the LLNF's master plan to make recommendations.

Methodology

Our primary methods involved surveys of different LLNF user groups, interviews with key stakeholders, and research of data and planning documents. We initially explored the LLNF property in person and informally interviewed staff to learn in more detail how they implement their strategic goals of stewardship, education, and research. Our team then designed and implemented a survey through an iterative consultation process for the LLNF stakeholders to determine which aspects of the LLNF's draft master plan should be prioritized and executed. While survey responses were being collected, we reviewed how other environmental and conservation organizations on Nantucket implement their strategic goals and plans in relation to land use and property management. Based on our overall findings, we created a structured set of recommendations for the LLNF's future master plan and based these recommendations on current LLNF goals and objectives, stakeholder viewpoints, and other organizations' environmental conservation and preservation goals.

Findings and Recommendations

Feedback from the survey and interviews showed there was substantial public interest in participating in programs offered by the LLNF although respondents suggested additional outreach from the foundation would create more awareness of current events and offerings. Respondents also wanted to see different types of trails at the property specifically, with highlighted trail features and access to points of quiet solitude, scenic vistas, and wetland vistas. Respondents indicated that updated informational interpretive materials placed at the entrances of the LLNF and around the property would be of use and interest to visitors. Viewing platforms, a dock on Long Pond, benches and picnic tables, and a new educational and research facility were likewise selected as possible additions of interest in the survey. In both the survey responses and interviews, the idea of a new multi-use facility was mentioned, where newer programs can be held to engage younger audiences as well as high school students in research opportunities on either side of the LLNF property. As one senior LLNF Board Member stated, one measure of the success of the master plan would be for the foundation to be recognized nationally as a research center, a goal which would be further promoted with the construction of a new facility.

Several respondents indicated that the inability to park and turn a bus in the current parking lot was a barrier to bringing students out to the LLNF property on field trips. Additionally, the parking lot lacks a designated handicap parking spot and the appropriate surface type and accommodations for those with ambulatory disabilities. Similarly, there are no accessible trails or viewing areas on the property.

Based on our findings from the survey and interviews, the actions items of the highest priority for consideration in the master plan, include:

- New research and education facilities;
- A bridge to connect the newly acquired parcel to the original parcels;
- New trails including points of quiet solitude, access to scenic vistas, and points of interest;
- New viewing platforms; and,
- The installation of more benches and picnic tables.

We additionally recommend:

- The LLNF update interpretive materials around the property to include more permanent, physical signage posted in the ground, easily noticeable and appropriately informational trail markers, and entrance signs to direct visitors.
- The LLNF consider hiring a land manager to take primary responsibility of maintaining the property.
- The LLNF redevelop their parking lot to include an expanded entrance and handicap parking spot, design a handicap accessible trail, install a post and rope guide systems, and create virtual trail tours.
- The LLNF establish educational and research opportunities targeted towards high school students as well as younger children.
- The LLNF advertise scheduled events and offerings weekly through social media, the LLNF website and newsletter, and local newspapers.

Authorship

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Executive Summary	JR	ALL
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2. Background	DW	ALL
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2.2	JR	ALL
2.2.1	IM	ALL
2.2.2	DC	ALL
2.2.3	DW	ALL
3. Methods Overview	DW	ALL
3.1	JR	ALL
3.2	DC	ALL
3.3	IM	ALL
3.4	DW	ALL
4.1 Findings	DC/DW	ALL
4.1.1	JR	ALL
4.1.2.1	IM	ALL
4.1.2.2	DW/IM/JR	ALL
4.1.2.3	DC	ALL
4.1.3	IM/DC	ALL
4.2.1	JR	ALL
4.2.2	DW	ALL
4.2.3	DC	ALL
4.3 Recommendations	ALL	ALL
References	ALL	ALL
Appendix 1	JR/DW	ALL
Appendix 2	ALL	ALL
Appendix 3	IM/DC	ALL

Table of Contents

Abstract	i
Acknowledgments	ii
Executive Summary	iii
Authorship	vi
Table of Contents	vii
Table of Figures	ix
Table of Tables	x
1. Introduction	1
2. Background	3
2.1 History of Land Conservation on Nantucket	3
2.1.1 Land Conservation Organizations on Nantucket	5
2.1.2 Strategic Planning and Operations	9
2.2 Linda Loring Nature Foundation	12
2.2.1 Habitats and Biodiversity	14
2.2.2 LLNF's Mission as a Private Land Trust	19
2.2.3 The Master Plan	22
3. Methods Overview	23
3.1 Objective (1): Assess how the LLNF currently implements its strategic goals of stewardship, education, and research through its various programs and activities.	25
3.2 Objective (2): Solicit stakeholder opinions in relation to the purpose, content, and future implementation of the LLNF draft master plan.	26
3.3 Objective (3): Identify how different organizations operate in their role of environmental conservation and preservation in Nantucket.	27
3.4 Objective (4): Review the content, structure, and purpose of the LLNF's draft master plan to make recommendations.	28
4. Findings, Conclusions, and Recommendations	29
4.1 Findings	29
4.1.1 Master Plan Survey Results	29
4.1.2 Interview Findings	40
4.1.2.1 LLNF Senior Board Member & Past Intern	40
4.1.2.2 Education Collaborator	41
4.1.2.3 Accessibility Collaborators	42
4.1.2.4 Conservation Partners	43
4.1.3 Observations from Site Visits to Other Conservation Properties	44
4.2 Conclusions	51

4.2.1 Master Plan Survey Conclusions	51
4.2.2 Interview Conclusions	52
4.2.3 LLNF Comparisons	53
4.3 Recommendations	54
4.3.1 Prioritized Actions	54
4.3.2 Interpretive Material Recommendations	55
4.3.3 Staffing Recommendations	56
4.3.4 Accessibility Recommendations	56
4.3.5 Educational & Research Program Recommendations	57
4.3.6 Outreach Recommendations	58
References	60
Appendix 1	63
1.1 Interview Preamble	63
1.2 Survey Preamble	64
Appendix 2	65
2.1 Objective 1	65
2.1.1.1 Stewardship Questions	65
2.1.1.2 Education Questions	65
2.1.1.3 Research Questions	65
2.1.1.4 Sign-Off	65
2.1.2 Senior Board Member Interview Script	65
2.1.3 Trails and Treats Feedback Survey	66
2.2 Objective 2	69
2.2.1 General Survey	69
2.2.2 Mickey Rowland and Brenda McDonough Interview Script	80
2.2.3 Isaac Hersh Interview Script	81
2.2.4 Matt Liddle Interview Script	82
2.3 Objective 3	82
Appendix 3	85
3.1 Objective (1): Assess how the LLNF currently implements its strategic goals of stewardship, education, and research through its various programs and activities.	85
3.2 Objective (2): Solicit stakeholder opinions in relation to the purpose, content, and future implementation of the LLNF draft master plan.	87
3.2.1 Methods for Survey Dispersal	90
3.3 Objective (3): Identify how different organizations operate in their role of environmental conservation and preservation in Nantucket.	91

Table of Figures

Figure 1: Cover to An Inventory and Interpretation Selected Resources of the Island of Nantucket	4
Figure 2a: Nantucket Island Open Space Properties Map	7
Figure 2b: Nantucket Island Open Space Properties Map Key	7
Figure 3: Linda Loring	12
Figure 4: LLNF Property Acquisition Over Time	13
Figure 5: The Geological Makeup of Nantucket with Approximate Location of the LLNF Property	15
Figure 6: LLNF Habitat Types on the Property	15
Figure 7: LLNF Sandplain Grassland Biodiversity	16
Figure 8: LLNF Sandplain Heathland Habitat	17
Figure 9: LLNF Shrub Swamp Habitats	18
Figure 10: Methodology Flow Chart	24
Figure 11: Distribution of Ethnicity Among Survey Respondents	30
Figure 12: Age Distribution Among Survey Respondents	31
Figure 13: Nantucket Residency Distribution Among Survey Respondents	31
Figure 14: LLNF Overall Trail Ratings	32
Figure 15: Prioritized Trail Features at LLNF	33
Figure 16: Prioritized Additions to LLNF Property	34
Figure 17: LLNF Interpretive Materials Ratings	35
Figure 18: Prioritized Interpretive Materials	36
Figure 19: Organizations Associated with Education on Nantucket	37
Figure 20: Organizations Associated with Research on Nantucket	38
Figure 21: Organizations Associated with Land Management on Nantucket	39
Figure 22: Tupancy Links Trail	47
Figure 23: Sanford Farm Trail	47
Figure 24: Creeks Preserve Trail	47
Figure 25: LLNF Trail	47
Figure 26: Tupancy Links Kiosk	48
Figure 27: LLNF Kiosk	48
Figure 28: Sanford Farm Informational Signs	49
Figure 29: Squam Swamp Trail Marker	49
Figure 30: LLNF Trail Marker	49
Figure 31: Gardner Farm Wetland Bridge	50
Figure 32: LLNF Proposed Wetland Bridge	50
Figure 33: Creeks Preserve Bench	50
Figure 34: Creeks Preserve Picnic Table	50

Table of Tables

Table 1. Prominent Local Environmental and Land Conservation Organizations on Nantucket	8
Table 2. Comparison of LLNF to NCF	10
Table 3. Breakdown of Stakeholder Groups Among Respondents	29
Table 4. Conservation Organization Property Comparison	45
Table 5. The LLNF Stakeholder Groups Defined	87

1. Introduction

Nantucket is an island 30 miles off the coast of Massachusetts that comprises 49 square miles of glacial debris left behind when glaciers receded approximately 10,000 years ago. The island boasts several rare habitats, including sandplain grasslands and coastal dunes that are home to several threatened species of flora and fauna. Fearing these rare resources would be threatened by the burgeoning tourist economy and associated housing development, a group of concerned citizens created the Nantucket Conservation Foundation in 1963. Since then, more than ten land conservation groups have organized to protect the island's natural resources. These organizations now own and manage more than 16,000 acres, or 52% of the island's landmass.

The Linda Loring Nature Foundation (LLNF) owns and manages a single property comprising 275 acres on the western end of the island between Eel Point Road in the north and Madaket Road to the south. The Foundation is one of the newest conservation organizations on Nantucket and is a wildlife sanctuary by every sense other than official certification, as they are a private organization and not public. In 1999, Linda Loring founded the LLNF by donating a 5 acres parcel of land, since then the Foundation's property has grown through additional gifts of land. Today, the property encompasses a wide range of habitats including sandplain grassland, heathland, shrub swamp, woodlands, and vernal pools. The LLNF mission focuses on land stewardship, education, and research. With the recent addition of 167.41 acres of adjacent land following Linda Loring's passing in 2019, the Foundation is in the process of developing a new master plan for the property.

The overall goal of this project was to assess the Linda Loring Nature Foundation Draft Master Plan from the perspective of stakeholders and community groups to prioritize actions that ensure future support and interest. In order to achieve this goal, we identified the following objectives:

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- 4.) Review the content, structure, and purpose of the LLNF's draft master plan to make

recommendations.

The methods we used to achieve these objectives primarily involved surveys to gain the opinions of the public and other stakeholder groups, interviews with people of interest defined by our sponsor, and careful research of collected data and planning documents provided by the LLNF.

After completing our objectives, some of the major conclusions and recommendations we came to involved the following: physical additions to the LLNF property most valued by the community, ways in which the LLNF could incorporate accessibility on their property, and new educational and research programs and opportunities the LLNF could implement with their newly acquired parcel of land.

2. Background

We began our assessment of the Linda Loring Nature Foundation's (LLNF) draft master plan by first researching and developing a description of the history of land conservation and preservation efforts on Nantucket. Topics covered include descriptions of organizations similar to the LLNF and how the LLNF and other land organizations operate and implement strategic goals. We also describe the history of the LLNF, including a brief introduction to its late founder Linda Loring and a description of the different habitats and biodiversity on the property. Finally, we describe the mission of the LLNF as a private land trust and provide an overview of the new master plan in its current stage of development.

2.1 History of Land Conservation on Nantucket

Nantucket is home to more than ten conservation organizations each of which serves to protect and manage portions of the island. Together they own more than 16,000 acres or approximately 52% of the island. Land conservation efforts on Nantucket began in 1963 when, at the urging of the Nantucket Civic League, a group of local residents established a non-profit organization known as the Nantucket Conservation Foundation (Lentowski, 2013). The group was concerned that growing tourism and economic development threatened the fragile natural resources and landscapes of Nantucket. The Foundation commissioned a team of experts from the University of Massachusetts (Amherst) and the Massachusetts Department of Natural Resources and Division of Fisheries and Game to conduct an inventory of natural resources in the summer of 1966. The team published a report (Figure 1) entitled *An Inventory and Interpretation Selected Resources of the Island of Nantucket* (Zube & Carlozzi, eds. 1966) which documented the natural resources of the island including geology, soils, vegetation, wildlife, land use, and more. The authors identified two critical areas, the coastal dunes and the heathlands, that were threatened by uncontrolled vehicular traffic. They expressed concern that:

“Long run human development of the land also adversely effects the heath vegetation. This is especially the case where roads and scattered housing cut up existing stands of heath into smaller and smaller blocks. This type of land use results [in] more and more "edge." It is on the edges of the heath vegetation that daily human activity takes its greatest toll. In general, management against this type of damage is a matter of arranging land use to cause the least amount of cutting up of the heath.”
(Zube & Carlozzi 1966, p.96)

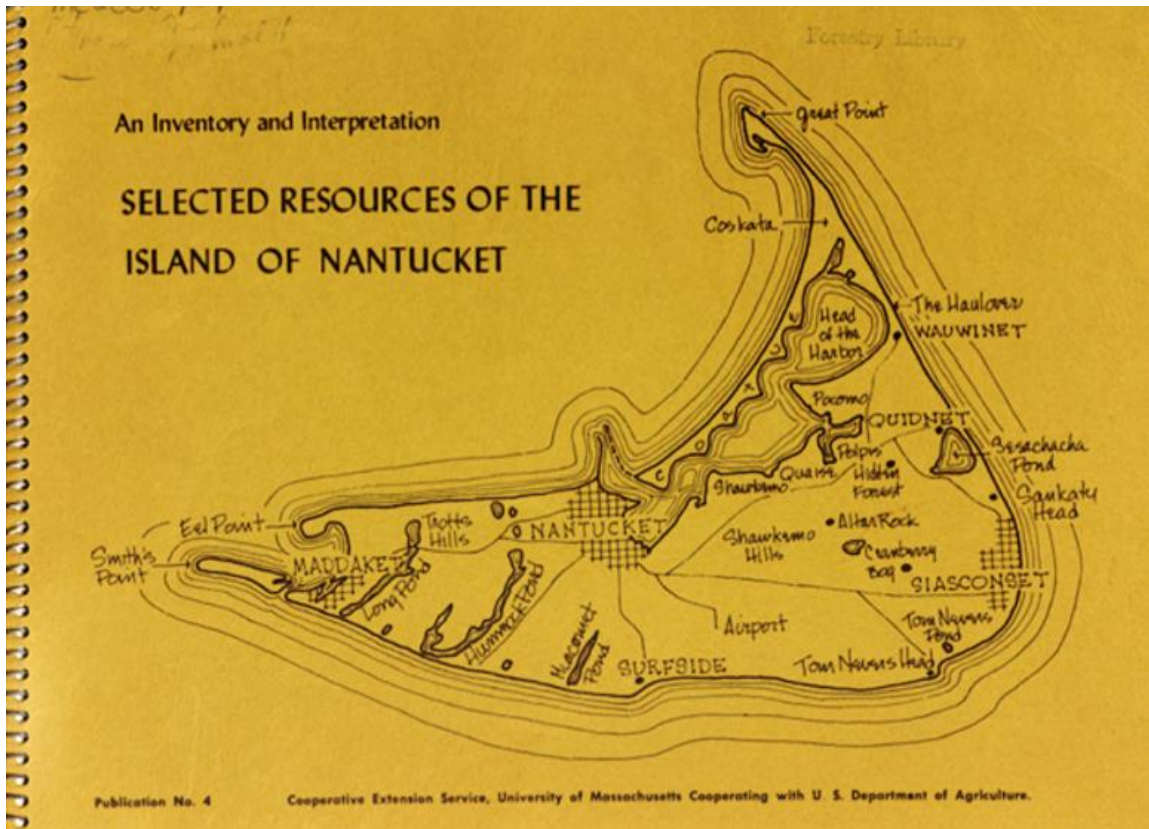


Figure 1: Cover to An Inventory and Interpretation Selected Resources of the Island of Nantucket (Zube & Carlozzi, eds. 1966)

In 1968, Professor Davis of the University of Massachusetts Department of Landscape Architecture conducted a survey of island voters and seasonal residents, in which they were asked if “more attention should be given to conservation matters on the Island?” A resounding 91% of respondents said “yes,” which spurred the Nantucket Conservation Foundation and the Town of Nantucket to pursue further efforts in land conservation.

The Nantucket Conservation Foundation began with approximately 2,500 acres of land donated by the foundation’s original supporters. Subsequently, the Foundation utilized community support to raise funds and acquire more land. By 2013, the Foundation had acquired 215 parcels representing 9000 acres of land through gifts of land and purchases (Lentowski, 2013).

By 1983, the Nantucket economy was booming as almost 300 new houses were being built annually. Many residents were becoming increasingly concerned that land protection efforts were falling behind. To compete with home buyers, Nantucket’s town planning advisor

developed a unique model to collect funds for the purchase of conservational and recreational land. With state approval, the Town placed a 2% surcharge on all private real estate purchases. The model ultimately became the first in the nation and led to the creation of the Nantucket Island Land Bank. The Land Bank now has the largest budget of any conservation organization on the island and controls almost 4,000 acres of conservation lands (Lentowski, 2013).

Following the lead of the Nantucket Conservation Foundation and Nantucket Land Bank, numerous other conservation organizations have emerged to protect the natural resources of Nantucket through public engagement and collaboration, discussed in further detail in the next section.

2.1.1 Land Conservation Organizations on Nantucket

Nantucket is not a large island, and yet it encompasses a large variety of on-island organizations dedicated to land conservation, natural resources, and the betterment of the environment through public education and research. The list includes the Nantucket Land Bank (NLB), the Nantucket Conservation Foundation (NCF), the Nantucket Land Council (NLC), the Sconset Trust, the Maria Mitchell Association (MMA), the Madaket Land Trust, the Tuckernuck Land Trust, and the Linda Loring Nature Foundation (LLNF). Figure 2a shows the locations of the parcels owned and managed by these organizations. Statewide organizations that have a presence on Nantucket include the Massachusetts Audubon Society, the Massachusetts Department of Fish and Game, the Trustees of Reservations, and The Nature Conservancy (Nantucket Land Bank, 2015).

Each of these organizations has a similar but slightly different purpose and each has developed their own styles of operation. As noted above, the Nantucket Land Bank serves to maintain land that they have acquired and enable public recreation and environmental protection in the areas they own. The Nantucket Conservation Foundation is a nonprofit organization that aims to protect and conserve Nantucket's natural beauty through the involvement of public interest in conservation efforts. Their mission is to promote conservation and stewardship, scientific research and outreach, public service to the community, and an overall positive experience while visiting their properties. Some actions they take to fulfill the different aspects of their mission include keeping track of and protecting the endangered flora and fauna on their property, removing invasive species, maintaining trails and making them more accessible, and

providing educational programs for visitor to teach them about the importance of their property (Nantucket Conservation Foundation, 2018). Depending on the specific property, the NCF allows many uses that other organizations may not. For example, a majority of the NCF's properties allow dogs, bikes, horses and even hunting. The Nantucket Land Council is slightly different; they are a nonprofit organization with a focus on maintaining conservation and development restrictions, offering public education on environmental issues, and enforcing laws pertaining to natural resource use on the land that they purchase. The mission of `Sconset Trust is to conserve areas of land on the eastern side of Nantucket, but also preserve historical, or otherwise significant structures in `Sconset (Nantucket Conservation Foundation, 2018). The Tuckernuck Land Trust aims to protect their land through environmental education and land stewardship in order to conserve the rare biodiversity and ecology on Tuckernuck Island, which is one of the smaller islands off the western coast of the Nantucket mainland (Tuckernuck Land Trust, 2020). Lastly, the MMA is a nonprofit organization that primarily works to educate the community about Nantucket by exploring the natural aspects of the island, including the sky above (Nantucket Conservation Foundation, 2018).

Organizations such as the Nantucket Land Bank and the Nantucket Conservation Foundation are similar to the LLNF because key components of their missions involve stewardship, research, and education, and conservation of their properties for the community enjoyment and for educational purposes. The organizations that differ from the LLNF are the Nantucket Land Council, the `Sconset Trust, and the MMA. For example, the `Sconset Trust preserves important historical structures along with the natural areas of their property while the MMA offers education on not only the land but also the sea and cosmos as well; they even have their own astronomical observatories. Table 1 presents an overview of the mission and other attributes of the Conservation Foundation, Land Bank, and Land Council. Table 1 serves to differentiate each organization from the other, especially the LLNF.

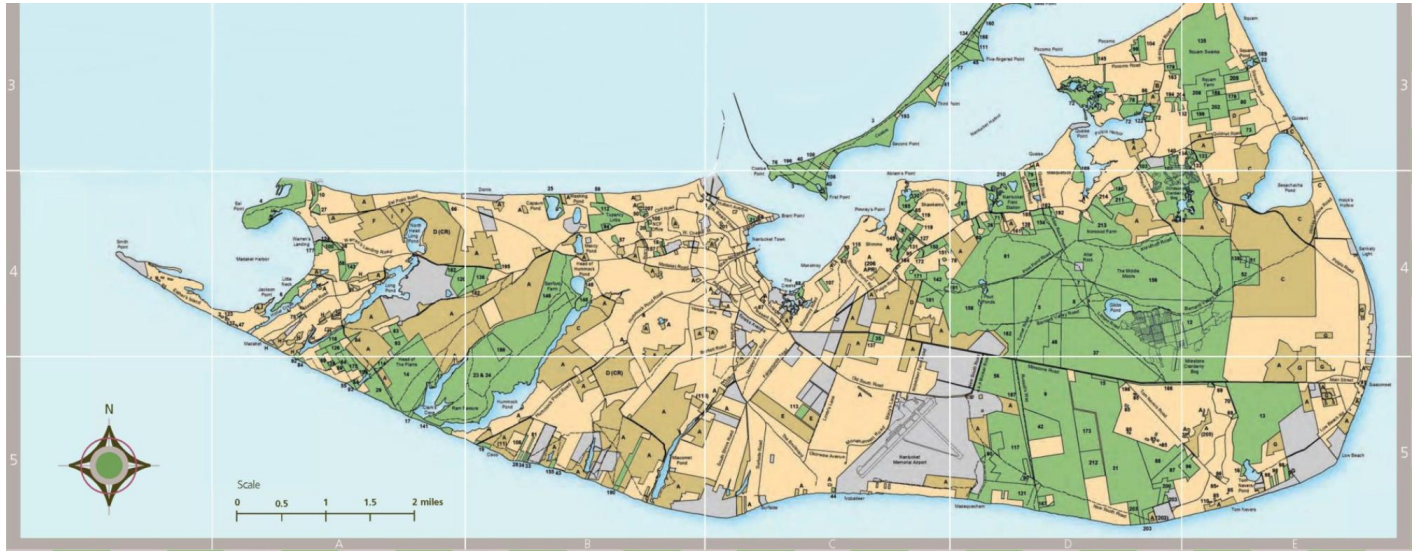


Figure 2a: Nantucket Island Open Space Properties Map (Source: adapted from Nantucket Conservation Foundation, 2016)

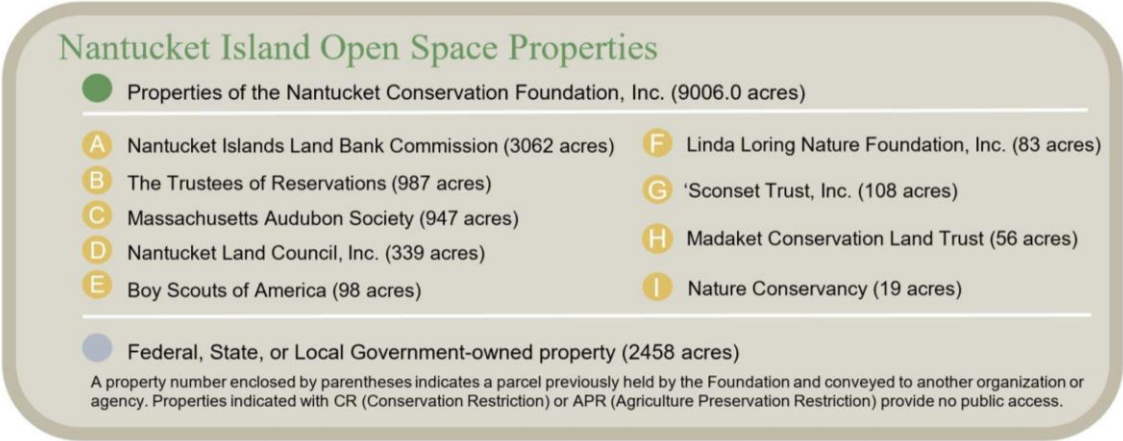


Figure 2b: Nantucket Island Open Space Properties Map Key
(Source: adapted from Nantucket Conservation Foundation, 2016)

Table 1. Prominent Local Environmental and Land Conservation Organizations on Nantucket

	<u>Nantucket Conservation Foundation</u>	<u>Nantucket Land Council</u>	<u>Nantucket Land Bank</u>	<u>Linda Loring Nature Foundation</u>
Established	1963	1974	1983	1999
Type	Private	Private	Public Agency	Private
Mission Statement	“The mission of the Nantucket Conservation Foundation is to assist in the preservation of Nantucket’s character by permanently conserving, maintaining, and managing natural areas and habitats and to encourage an appreciation of and interest in the Island’s natural resources” (Conservation Foundation, 2018).	“The NLC is a 501 (c)(3) non-profit dedicated to protecting Nantucket’s natural world and rural character by holding and enforcing conservation restrictions, commissioning scientific research, monitoring development proposals, engaging in legal proceedings to protect natural resources, and educating the public on local environmental issues” (Land Council, 2018)	“The Nantucket Islands Land Bank is a land conservation program created to acquire, hold, and manage important open spaces and endangered landscapes for the use and enjoyment of the general public” (Land Bank, 2021).	“The Linda Loring Nature Foundation preserves the biological diversity of its 275-acre property on Nantucket and connects people of all ages to nature through outstanding environmental education and research” (Linda Loring Nature Foundation, 2021).
Purpose	<ul style="list-style-type: none"> - Conservation and Stewardship - Property Experiences - Scientific Research and Outreach - Public Community Service 	<ul style="list-style-type: none"> - Planning - Protecting - Preserving 	<ul style="list-style-type: none"> - Land Conservation - Regulation of Protected Land Laws 	<ul style="list-style-type: none"> - Conservation and Stewardship - Wildlife Sanctuary - Research - Education
Property Acreage	> 9000 acres	~ 530 acres	~ 3,880 acres	275 acres
Primary Sources of Funds	<ul style="list-style-type: none"> - Membership - Donations 	<ul style="list-style-type: none"> - Membership - Donations - The Water Fund - NLC General Fund 	2% fee from real estate transfers on Nantucket	<ul style="list-style-type: none"> - Membership - Donations - Grants
Staff	<ul style="list-style-type: none"> - 17 Full-time staff members ~ 5 Seasonal staff members 	<ul style="list-style-type: none"> - 4 Full-time staff members 	<ul style="list-style-type: none"> - 8 Full-time staff members - 2 Part-time staff members 	<ul style="list-style-type: none"> - 4 Full-time staff members
Board Members	<ul style="list-style-type: none"> - 6 Executive board members - 25 Trustees - 12 Advisors - 5 Emeritus 	<ul style="list-style-type: none"> - 5 Executive board member - 22 Board members - 1 Scientific Advisor - 1 Honorary Director - 5 NLC Associates 	<ul style="list-style-type: none"> - 5 Elected Commissioners 	<ul style="list-style-type: none"> - 8 Officers - 6 Trustees - 4 Lifetime trustees

2.1.2 *Strategic Planning and Operations*

There are several nature foundations and land trusts on Nantucket with master plans and strategic plans similar to that of the Linda Loring Nature Foundation. One such organization is the Nantucket Conservation Foundation which created a five-year strategic plan in early 2019. This foundation's plan is relevant because it has several similarities to the concepts that the LLNF has put into their draft master plan, which will be discussed in detail in Section 3. Table 2 compares the NCF to the LLNF in areas of mission, location, property size, and offered programs. Both foundations value education, research, and stewardship in their plans as they both want to use their land to teach the public about the value of nature. The programs are somewhat different but both foundations co-organize a coastal ecology of Nantucket course that helps to educate residents about their island's environment.

The NCF identified four areas of growth and development (Gosnell, 2019):

- Conservation and stewardship,
- Scientific research and outreach,
- Property experiences,
- Public services to the community

Conservation and stewardship involve the management and acquisition of the parcels of land themselves. The NCF acquires land through donations made by “individuals, organizations, estates, bequests, and trusts” (Nantucket Conservation Foundation, 2021). By comparison, the LLNF has acquired its land by purchase or donation from organizations, trusts, individuals, and the Linda Loring estate. Historically, the LLNF has remained localized to one area with their parcels of land, the NCF strategically focuses on parcels that have conservation value anywhere on Nantucket. This value is characterized by the quality and type of land itself and also by its relative proximity to nearby conservation properties. Stewardship encompasses the monitoring and care of the wildlife and their habitats on the properties through careful management and protection programs. Scientific research and outreach include the NCF's Department of Science and Stewardship, which works hard to know what the property needs ecologically. All the property management decisions are based on the research done in this department so that the rare or endangered species and habitats can be cherished and preserved.

Table 2. Comparison of LLNF to NCF

	Linda Loring Nature Foundation	Nantucket Conservation Foundation
Stewardship and Conservation	An adaptive management plan informed by research, knowledgeable experts, and innovative ideas; Limiting and mitigating threats to the native biodiversity; Providing an undisturbed, undeveloped area for scientific research, environmental education, and passive recreation (Adapted from: Linda Loring Nature Foundation, 2021)	The Properties Maintenance Department maintains: trails, fields fences, signs, gates, parking areas, buildings, vehicles, and mowing equipment in order to perform the property’s stewardship
Land Management	Promoting biodiversity through disturbances, invasive species removal, mechanical soil disturbances, native seed collection, no prescribed fires Help from: Nantucket Biodiversity Initiative (NBI)	Rangers perform maintenance by: Wildfire Prevention Program: controlled burning, invasive plant species management, native seed collection and plant propagation, and shorebird monitoring and protection. Help from: Nantucket Biodiversity Initiative (NBI), and the Sandplain Grasslands Network (SGN)
Current Research	Field phenology observations, Phenology Twig warming, Pollinators in Xeric grasslands, Sandplain Grassland Network (SGN), Snake diversity, Rare Species Monitoring, Independent research	Restoration Research: sandplain grasslands, salt marsh, windswept bog wetlands Monitoring: Hither Creek salt march outwash, Northern Long-eared Bat population, Spotted Turtle population, grassland deer browse research, Nantucket Vascular Flora
Educational Programs	Summer Programs: Birding field trips, Biodiversity walks, Story walks, Kids and Family programs Year-Round: Citizen Science, coastal ecology of Nantucket course, after school programs, in-class workshops, field trips, private birding	Coastal ecology of Nantucket class
Activities and events	<u>BioBlitz</u> , Nantucket walkabout, <u>Science Pubs</u> , LLNF Trails and Treats event	Race for Open Space, Sunset at Sanford, Bash in the Bog, Cranberry Festival, Cranberry Harvest walking tour, Nanpuppets Show, Deer hunting on some properties,
Prohibited Activities	Hunting, dogs, horses, and bicycles	Unleashed dogs, no dogs at some locations, disturbing wildlife, damaging or removing plants, overnight camping and parking, and littering

The NCF employs similar methods as the LLNF to manage its lands, as seen in Table 2, such as the removal of invasive species, and working with the Nantucket Biodiversity Initiative (NBI) to promote biodiversity through different strategies. The NCF, however, also uses maintenance practices that the LLNF does not, such as controlled burning to promote and maintain particular species. For the LLNF, property management has been less aggressive as the current Conservation Restriction does not permit more extreme methods of land maintenance. Thus, controlled burns, major mowing, and intensive tree removal are not consistently done on the property. For the NCF, ‘property experiences’ combine land management opportunities for visitors. The main areas of focus are “trail development and management, property access expansion, and implementation of a mobile application to enhance current users’ experiences and improve educational opportunities” (Nantucket Conservation Foundation, 2021). These are especially important in the summer months when Nantucket experiences an influx of travelers and tourists. Table 2 shows that the two foundations offer a range of educational programs and activities and events for visitors and members throughout the year. The last section of the NCF’s strategic plan defines public service to the community, which explains how it educates the visitors about the importance of their mission with regard to the history of the land and its culture. They do this by providing visitors one-on-one lessons with representatives of the foundation through their Ranger Program (Nantucket Conservation Foundation, 2021).

2.2 Linda Loring Nature Foundation

Linda Loring was a visionary who recognized the dangers of development on Nantucket from the perspective of the natural world. As a young girl, Loring found inspiration in nature when her mother took her to the Statler Ballroom in Boston for lectures about birds. Loring was introduced to Nantucket at the age of one while on a vacation with her family. After the trip, Loring's grandfather bought a home on Nantucket because of the noticeable improvement in happiness and health he saw in the family. This single action became Loring's path to visiting regularly and eventually settling as a full-time resident of Nantucket (Stanek, 2021). Loring believed that everyone should have the



Figure 3: Linda Loring

opportunity to connect with nature and wanted to establish a foundation where land was preserved and used as a common ground for people of all ages to interact. She dreamed of maintaining an open classroom for people to learn of the different species of flora and fauna on an undeveloped part of the island so that they might be closer to nature. Loring focused on involving children with nature and claimed that “[no] one except babies can escape tragedy, but if you have a background in nature, it helps” (Stanek, 2021).

In 1957, Loring was presented with the opportunity to purchase land along Eel Point Road. With the greater goal of using the land to focus on educating local children, Loring continually purchased land in the area to protect it from future developers and create a contiguous parcel of open space. In 1999, this goal was actualized when Loring donated five acres of her property to establish the Linda Loring Nature Foundation. The [Nantucket GIS Maps](#) depict the growth of LLNF property through records of land sales over the years. As seen in Figure 4, LLNF started in 2000 with the 5.90-acre parcel of land outlined in pink (Town and

County of Nantucket, 2021). LLNF became operationally active in 2007 when Kitty Pochman was hired as executive director and was followed by a larger land acquisition of 82.63 acres in 2008, outlined in dark blue (Linda Loring Nature Foundation, 2021). In 2016, an additional parcel of 18.30 acres was donated by the Nature Conservancy (outlined in brown), which created a contiguous property of 106.83 acres. In 2019 following Loring’s death, the LLNF acquired the 167.41 acres of land outlined in red, bringing the total acreage owned and managed by the foundation to 274.24 acres (Town and County of Nantucket, 2021). With the new addition, the LLNF property borders the majority of North Head Long Pond, and although the State of Massachusetts owns the body of water, the LLNF still has access to it for use.

LLNF Property Acquisition Over Time

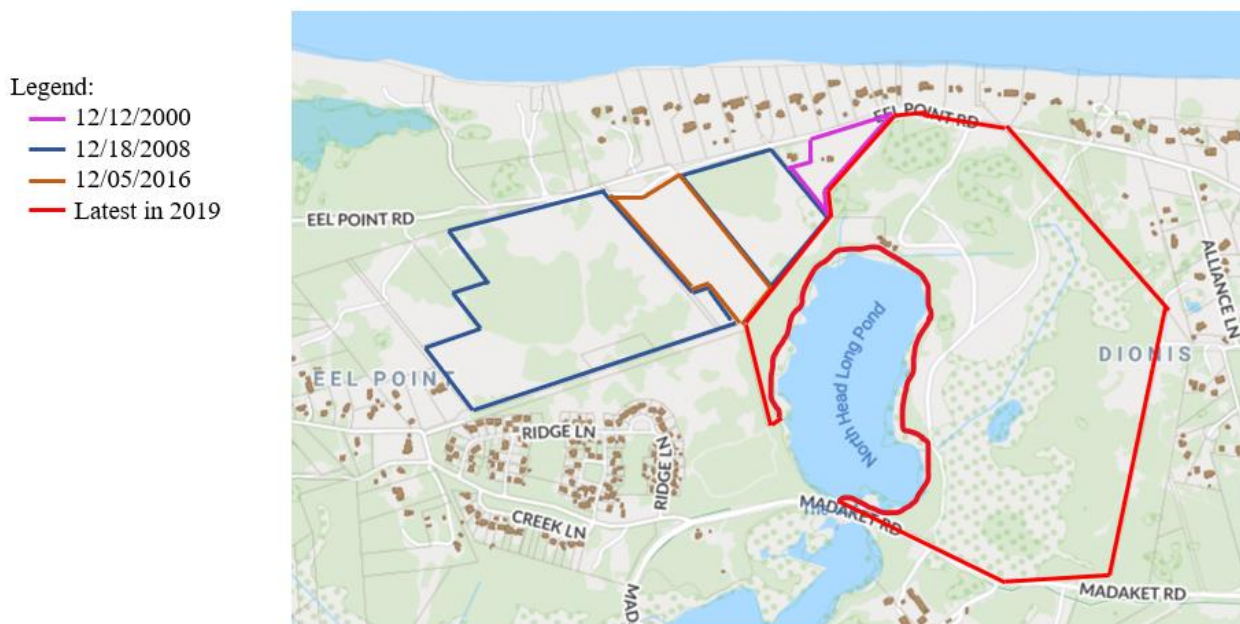


Figure 4: LLNF Property Acquisition Over Time (Source: Nantucket GIS Maps, 2021)

The LLNF is classified as a 501(c)(3) organization which establishes the foundation as a private non-profit group. The majority of its funding comes through outside contributions, such as private donations or grants (IRS, 2021).

One of the most recent grants was awarded by Robert F. Schumann Foundation for \$51,000 with the purpose of “avian habitat improvement at the LLNF property through invasive species removal, ecological restoration, and associated monitoring” (Engelbourg, 2020). Other sources of revenue include interest on savings, dividends, and sales of assets such as

memberships. Based upon the 990 tax documentation filed in 2019, the LLNF had reported a total revenue of \$11,142,290 for the year (Schwencke & Tigas, 2021). This is significantly higher in comparison to past years due to the inheritance from Linda Loring's estates. Normally, the organization's revenue ranges between \$155,000 and \$743,000 (2011-2018). Based on revenue, the LLNF is better endowed than some conservation groups on Nantucket, such as the Sconset Trust, but smaller than others, such as the Nantucket Conservation Foundation or Maria Mitchell Association (Schwencke & Tigas, 2021).

2.2.1 Habitats and Biodiversity

The island of Nantucket had originally been a part of the mainland in North America until approximately 5,000 to 6,000 years ago (Oldale, 2001). The landmasses separated due to the natural effects of a glacial retreat and rising sea levels where meltwater flooded the land bridge. The meltwater had also carried a wide range of rocks and other debris that created geographical features on the island such as kettle ponds, glacial moraines, and outwash plains seen in Figure 5.

The majority of the Linda Loring Nature Foundation property comprises rare sandplain grasslands, sandplain heathlands, and shrub swamps (Figure 6). In addition, there are two vernal pools on the property that have been documented and certified by the Natural Heritage & Endangered Species Program (NHESP). This mix of habitats promotes a diversity of flora and fauna on the property as explained further below.

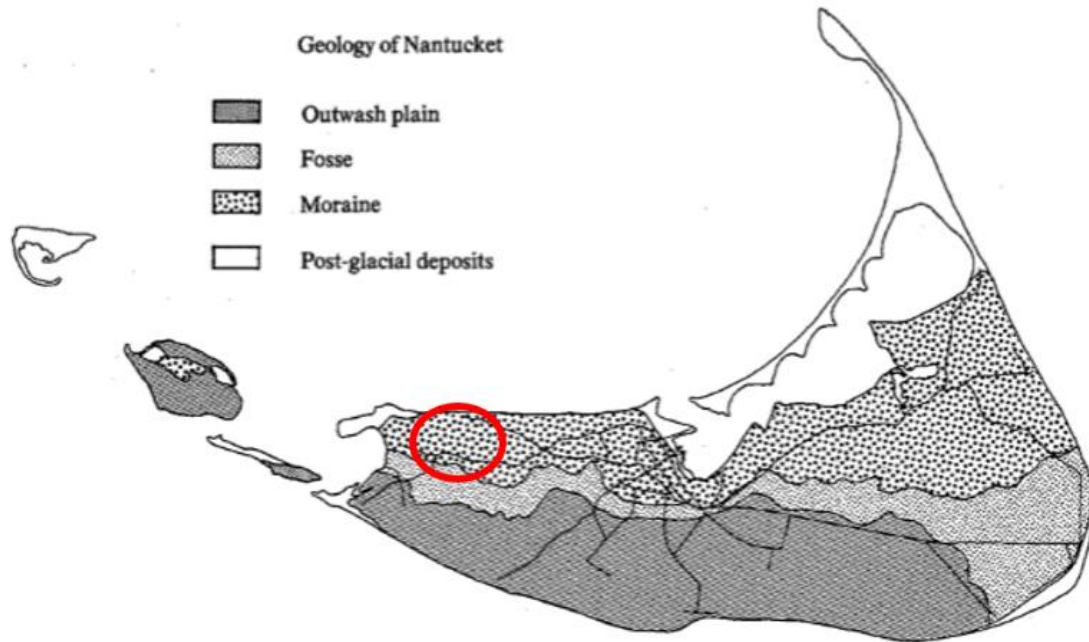


Figure 5: The Geological Makeup of Nantucket with Approximate Location of the LLNF Property (Source: adapted from Lang & Stout, 1992)

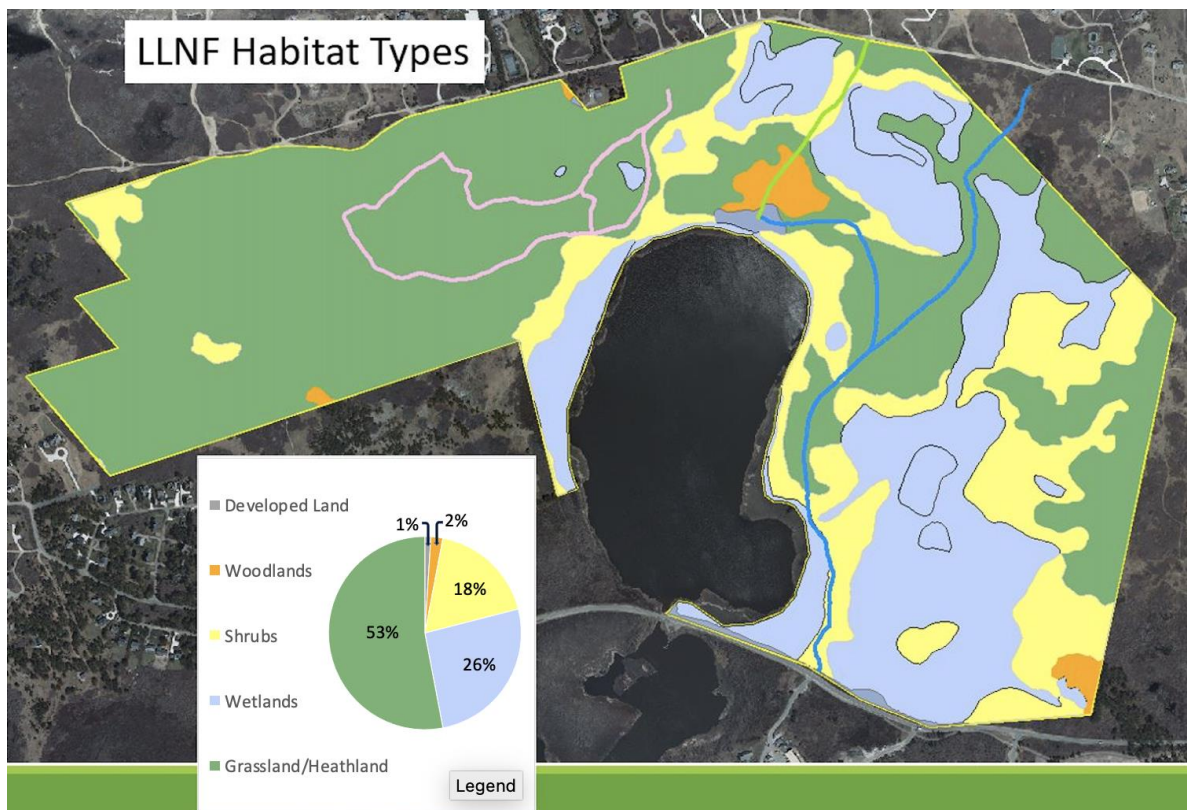


Figure 6: LLNF Habitat Types on the Property

Sandplain grasslands are globally threatened coastal communities with either sand or other dry low nutrient soil types and are accustomed to being salted by the coastal winds, and impacted by seasonal temperature fluctuations. The strong salt-laden winds inhibit the growth of trees and major shrubs which are sparse in this habitat. The resulting open landscape provides a perfect home for dominating grass species including Pennsylvania sedge, sandplain blue-eyed grass, poverty grass, New England Blazing Star, as well as shrubs species such as scrub oak, bearberry, black huckleberry, lowbush blueberry, and many types of the herbaceous perennial, like goldenrod (see Figure 7). One easy way to differentiate between sandplain grasslands and sandplain heathlands is by the heathland's abundant patches of shrubs, referred to as clonal patches. Many herbaceous vascular species (e.g., butterfly weed, goat's rue, colic-root, yellow wild indigo, bird's foot violet) thrive in such sandplain heathlands and other dry habitats inland as well (MassGov, 2016a).

Sandplain grasslands



Grasshopper sparrow



Chain-dot geometer



Sandplain blue-eyed grass



New England Blazing Star



Northern Harrier



Figure 7: LLNF Sandplain Grassland Biodiversity (Source of bird photos: Laux, n.d.)

Sandplain heathlands are also globally threatened coastal communities located on moraines and coarse sandy outwash plains. Sandplain grasslands and heathlands occur in the same ecological conditions and thus share approximately 70% of their dominating plant species. However, the heathland habitat stands out because they are typically less biodiverse (see Figure 8). Heathlands have a high density of tall shrubs with no trees, with separation between clonal patches due to occasional breaks for bare or lichen-covered earth. Nantucket's agricultural land experienced substantially increased area and therefore productivity in the mid-1800s when clearing, grazing, and controlled burning became common practices for land maintenance. Today, heathlands are characterized by the dominance of broom crowberry, bearberry, and black huckleberry and the common low plants, shrub oak, lowbush blueberry, bayberry, and other woody shrubs. Along with the common, more grass-like plant species, the heathlands provide the required habitat for uncommon Massachusetts plants: sandplain blue-eyed grass, sandplain flax, purple cudweed, eastern silvery aster, broom crowberry, and butterfly weed (MassGov, 2016b).



Figure 8: LLNF Sandplain Heathland Habitat

The LLNF has smaller habitats of pitch pine woodland forests with Japanese Black Pine along the southern edge of the property (see Figure 5). With an open canopy forest structure and a dense understory of shrubs, these small forests are unlike traditional tall pine stand forests that are common in Massachusetts. Left to grow without controlled burns or other disturbances, the patch is at risk of being taken over by less fire-tolerant species. One such species is the invasive Japanese Black Pine, which has been subject of intensive removals for years at the LLNF

property. If the current small section of forest experiences a shift in its community and gains a higher proportion of less fire-tolerant species, there is a threat that future fires would severely damage the forest (Mass Wildlife, n.d.).

Nantucket shrub swamps are present in small parcels of the LLNF property (see Figure 9). A shrub swamp is a common type of wetland that occurs with temporary or seasonal flooding of soils. The average height of the shrubs ranges from less than 1 to 5 meters due to their proximity to bodies of water and the variety of shrubbery present. The density of graminoid, herbaceous shrubs to open water can either be fairly open (25-75%) to dense (greater than 75%). Soil types for this habitat are typically made up of well-decomposed organic material and mineral-rich earth. Common species that thrive in these moisture-rich transition zone-based habitats include, “alders, meadowsweet, buttonbush, swamp azalea, silky dogwood, winterberry, arrowwood, and poison sumac” which are all either dominant or codominant shrub species (MassGov, 2016c). Dewberry, Canadian burnet, and water-willow will be found closer to the water source as they are low growing and weak-stemmed. Usually, shrub swamps have more than 25% canopy cover from sparse stunted trees or highbush blueberries, which are known to thrive on LLNF’s property (MassGov, 2016c).



Figure 9: LLNF Shrub Swamp Habitats

Another feature of the property at LLNF is the presence of relatively rare vernal pools. Within the last several years, pools on the property were surveyed and officially certified by the

Natural Heritage and Endangered Species Program (NHESP) as true and endangered vernal pools. These pools are formed when low spots fill with groundwater or rainfall in the fall or early winter and remain a still body of water until spring or mid-summer. Because the water will inevitably disappear at the end of the year or at least within only a few years, any fish populations that have appeared do not survive long. The absence of fish populations allows amphibian and invertebrate species to breed free from predators (MassGov, 2021).

Overall, the LLNF property is mainly open with varied habitats desired by many migratory species, as well as the year-round native wildlife. Some of the species that are commonly observed include white-tailed deer, osprey, northern harrier, grey seal, and many shore, water, and songbirds. Five rare Massachusetts plant species, “*Corema conradii* (broom crowberry), *Linum intercursum* (yellow flax), *Crocianthemum dumosum* (bushy rockrose), *Amelanchier nantucketensis* (Nantucket shadbush), and *Sisyrinchium fuscatum* (sandplain blue-eyed grass),” were identified on the property in 1983, adding to the importance of preserving this landscape and its biodiversity (Linda Loring Nature Foundation, 2021).

The most recently acquired 167.41 acres of land corresponding to the east half of the LLNF property is outlined in red on Figure 3. This section of the property has no trails in use currently and because it is dominated by wetlands and shrubs, unlike the original parcel, everything past the green line in Figure 5 is inaccessible.

2.2.2 LLNF’s Mission as a Private Land Trust

The Linda Loring Nature Foundation’s mission aims to protect and maintain “the biological diversity of its 275-acre property on Nantucket” as well as to connect “people of all ages to nature through outstanding environmental education and research” (Linda Loring Nature Foundation, 2021). In 2020, the Linda Loring Nature Foundation began the process of creating a new strategic and master plan spurred by the acquisition of 167.41 acres of land following Linda Loring’s death in 2019.

Land stewardship is a critical aspect of LLNF’s mission because it is “the responsible use and protection of the environment through conservation and sustainable practices” (Linda Loring Nature Foundation, 2021). The LLNF aims to enhance their land and its uses while also maintaining and protecting the biodiversity present on their property. This aspect of their mission involves practices such as removing invasive plant species to reduce their threat to the native

flora and fauna. It also involves designating certain undisturbed areas on the property for the purpose of collecting data, teaching the community about nature, and for the enjoyment of the land.

The LLNF aims to develop a management plan to control their stewardship practices by examining data collected in the field and creating “innovative ideas to attain [their] conservation goals” (Linda Loring Nature Foundation, 2021). Because stewardship efforts rely on staff availability and funding, this management plan is essential (Linda Loring Nature Foundation, 2021). Other management practices at the LLNF include the collection and spread of native seeds to promote native plant growth in areas where invasive species once were and the disturbance of soil to remove unwanted plants and to promote native plant growth. Many of these stewardship efforts to protect against invasive species were further supported as the result of the \$51,000 grant they received in 2020 from the Schumann Foundation. For those who may be interested in land stewardship, the LLNF offers various volunteer opportunities along with potential jobs, such as Seasonal Field Conservation Assistant, and internships within this practice (Linda Loring Nature Foundation, 2021).

Another key component of the LLNF’s mission is educating the community about the importance and values of nature, emphasizing why people should protect it. Educational aspects include solidifying program opportunities for students in primary and secondary schooling, as well as creating more educational programs geared towards adults. Their mission also includes the opportunity for the LLNF staff members to assist in mentoring high school and college students by guiding them through their own independent research as well as other project-based learnings. The goal of this component is to boost community interest in the trust and thus create an entirely new community of people who care about and want to connect with nature. Birding field trips are an example of specific educational programs offered by the LLNF and is one of the more popular programs offered; involving volunteers from the foundation guiding participants around the island and educating them on the variety of birds inhabiting Nantucket. These trips are usually scheduled weekly. The biodiversity walks are another example of the LLNF educational programs, encouraging participants to walk the trails and learn about the plant and animal life on the property. Additionally, the LLNF and the Nantucket Conservation Foundation offer a course about the coastal ecology of Nantucket. LLNF also hosts a monthly science pub event that is organized with local bars and restaurants to appeal to a more adult-based audience.

Due to outbreaks of COVID-19, these science pub events moved to a more virtual setting as they are conducted and recorded on Zoom to which the foundation later posts to their website. The LLNF has provided many ways for people of all ages to get involved in learning and aiding the environment, especially on Nantucket itself, in hopes to preserve the land for many more generations to come (Linda Loring Nature Foundation, 2021).

The research, which is being conducted on the property as well as on the adjacent pond, is the final key focus of the LLNF's mission to support stewardship and educational activities on their property. This is done in part by seeking cooperation from students and others in academia to create a research community. As part of their draft master plan, the LLNF also plans to make growth in their current research methods and branch out to "meet new opportunities for meaningful discoveries in the natural sciences" (Linda Loring Nature Foundation, 2021). The LLNF implements multiple different factors into its research mission. For instance, they conduct studies to record information about invasive species and how they affect the native species on the property. They also facilitate research projects involving the affects certain plants and animal species on the property are facing due to climate change. The LLNF partners with similar organizations on Nantucket to help fulfill their research mission, some of which include, but are not limited to:

- The Invasive Plant Species Committee
- The Nantucket Prescribed Fire Program
- The Maria Mitchell Association
- The Nantucket Land Council
- The Nature Conservancy
- The Nantucket Conservation Foundation
- The Nantucket Land Bank

There are many on-site opportunities for the public to assist the foundation in the research and data collection as well; the LLNF Conservation Fellows Program allows students of higher education to conduct conservation research directly on the foundation's property. The LLNF has also developed a yearly public event called the BioBlitz, where they promote exploration for natural discovery tracked through an app/website called iNaturalist. Thanks to the participation of the general public through this event, there have been hundreds of interesting finds from

various wildlife species to vast plant diversity identified across the property (Linda Loring Nature Foundation, 2021).

2.2.3 The Master Plan

Following the inheritance of an extensive land parcel from the late Linda Loring, the foundation initiated efforts to create its first master plan. The LLNF staff acknowledged a need to develop its infrastructure on the property to better achieve the overall mission and strategic plan of the foundation. The proposed changes and improvements detailed in the draft master plan include facility renovations, volunteer staff housing, new trails, and more. The draft master plan is established as a multi-phase implementation process with Phase 1 focused on the expansion of programmatic space for research and education. The detailed planning of Phase 1 was originally scheduled to be completed in August of 2021. However, due to environmental concerns with climate change and rising sea levels, the board and planning committee were brought back in to reevaluate the situation. Completion of Phase 1 is now projected to be in late December. The following phases will consist of work to demolish Linda Loring's old home, plan for more trails on the property and find a way to connect the original LLNF property with the new addition from Loring. Funding for this project is still in the planning stage as the LLNF intends to organize a capital campaign for the revenue required for the physical development of the master plan. As for now, the master plan continues to be considered a draft plan and the foundation seeks to gain input from stakeholder groups and the Nantucket community in regard to their future master plan.

3. Methods Overview

The goal of this project was to assess the Linda Loring Nature Foundation Master Plan from the perspective of stakeholders and community groups to prioritize actions that ensure future support and interest. In order to achieve this goal we developed the following four objectives:

- 1.) Assess how LLNF currently implements its strategic goals of stewardship, education, and research through its various programs and activities.
- 2.) Solicit stakeholder opinions in relation to the purpose, content, and future implementation of the LLNF draft master plan.
- 3.) Identify how different organizations operate in their role of environmental conservation and preservation on Nantucket.
- 4.) Review the content, structure, and purpose of the LLNF's draft master plan to make recommendations.

Our primary methods involved surveys of different segments of the public, interviews with key stakeholders, and research of data and planning documents. Figure 10 below depicts a visual representation of the objective and task breakdown in relation to the overall project goal

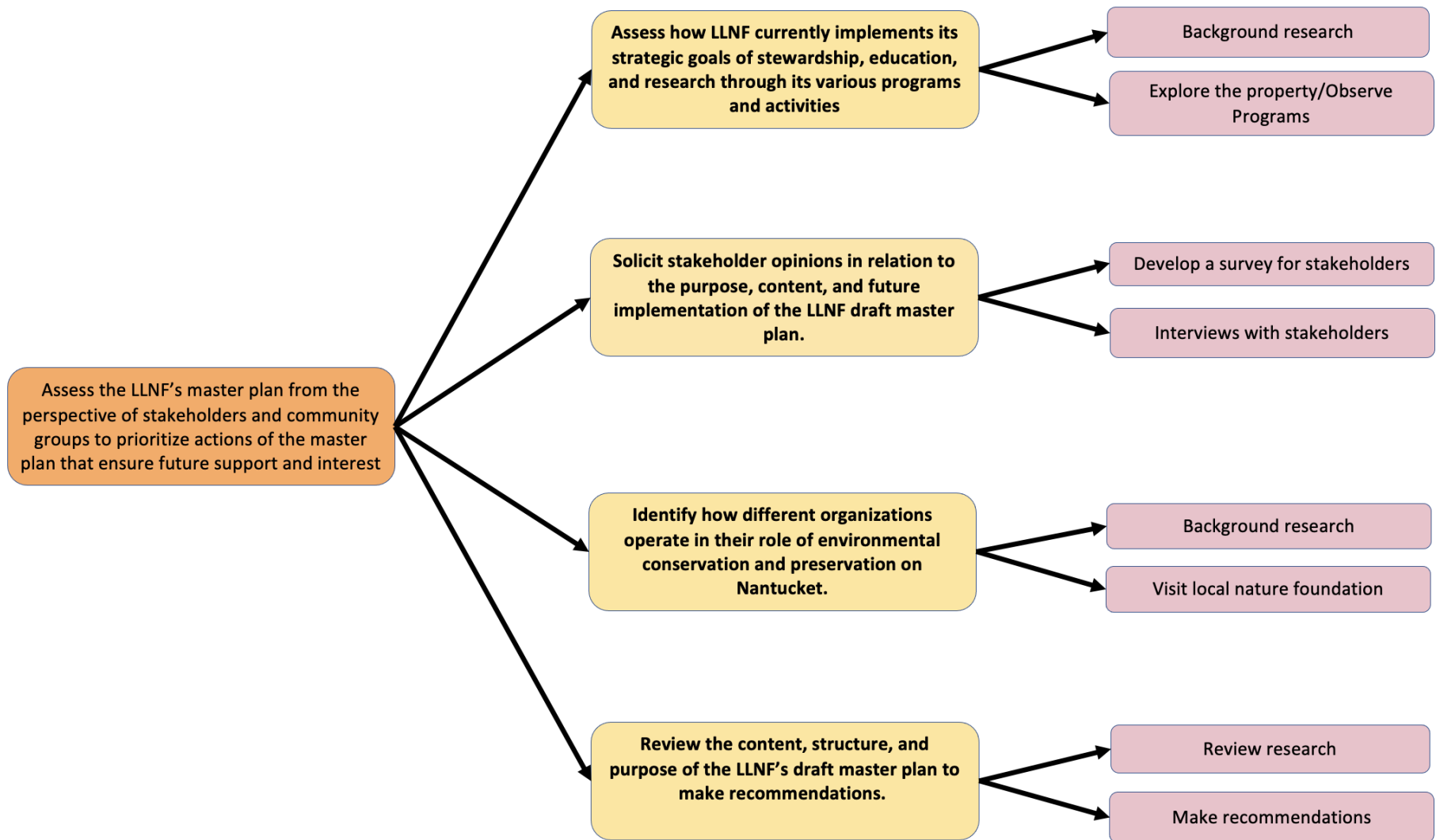


Figure 10: Methodology Flow Chart

3.1 Objective (1): Assess how the LLNF currently implements its strategic goals of stewardship, education, and research through its various programs and activities.

We explored the LLNF property in person and informally interviewed staff to learn in more detail how they implement their strategic goals of stewardship, education, and research. We wanted to know for:

- Stewardship, what practices have been set in place to maintain the property in relation to accessibility around the property and ecological wellbeing?
- Education, how is the property incorporated into educational programs that focus on specific audiences?
- Research, what are the benefits of having research programs take place directly on the property?

To understand how the LLNF staff envision and utilize their property from the perspective of its strategic goals, we walked the LLNF property both on our own and on a guided tour with members of the LLNF staff. While walking the property on October 22, 2021 during an informal interview with the LLNF staff, we asked prepared questions as listed in Appendix 2 Section 2.1.1 to 2.1.4. This process allowed us to become more familiar with the land and develop a list of notes to reference when we were developing a survey to solicit public opinion on ideas presented in the draft master plan and create recommendations later on. We took a separate tour of the LLNF property on November 1, 2021.

Apart from interviewing the staff and exploring the property, we also observed the annual Trails and Treats event at the LLNF on October 29, 2021 to get a better understanding of how programs are run and learn how the staff interacts with the public. Observations from the event were noted and used in review later when a feedback survey for the event was developed in Qualtrics (Appendix 2 Section 2.1.5). We pretested this survey by sending it to our sponsors, advisors, and the other students in our IQP cohort to obtain their feedback.

We interviewed a Senior Board Member on November 22, 2021 to get a better understanding of how he sees the master plan and future improvements at the LLNF from the perspective of the LLNF Board. The interview script can be found in Appendix 2 Section 2.2.2 and the information collected can be found in (add in reference to results section later). A more detailed description of this objective's method can be found in Appendix 3 Section 3.1.

3.2 Objective (2): Solicit stakeholder opinions in relation to the purpose, content, and future implementation of the LLNF draft master plan.

Our team designed and implemented a survey for the LLNF stakeholders to determine which aspects of the LLNF's draft master plan should be prioritized and executed. This was accomplished in an iterative consultation process with the LLNF staff. During this process we discussed the range of topics to be addressed, the wording of questions and choice of response options, the different stakeholder groups to be targeted, and the methods for distributing the survey. The stakeholders, defined by the LLNF, consist of nine main user groups: General Public, Recreational Users, Desired Future Educational Users (Adult Educational Users), PreK-12 Educational Users, Research Collaborators, Neighbors, Past Interns/Volunteers, Accessibility Collaborators, and Equity and Inclusion Stakeholders. Each group contained members of importance to the LLNF. These groups consisted of either individuals who interact with the property and have participated in programs the most, have previously worked with the foundation, and/or live adjacent to the property, as well as community members who may have never visited or had even heard of this organization. More on these groups can be referenced in Table 6 in Appendix 3. These particular user groups were helpful in determining what general improvements and developments the LLNF should prioritize while including the new land addition, along with understanding what programmatic implementations respondents valued the most.

The methods by which we gained input varied depending on the groups themselves. Generally, we surveyed all of the stakeholder groups and only interviewed key members of certain groups. The general survey pertained to the new master plan and included questions to be answered by every stakeholder group as well as group specific questions. The main part of this survey comprised eight parts:

- Familiarity with the LLNF property and what they do as an organization
- Familiarity with other environmental and conservation organizations on Nantucket
- Familiarity with the LLNF's programmatic aspects (research and education)
- Quality of the LLNF's property (trails, interpretive materials, accessibility, etc.)
- Potential interest in new additions to the LLNF property (trails, interpretive materials, dock, viewing platforms, etc.)
- Potential interest in new programs offered by the LLNF

- General improvement of inclusivity

The interview results can be found in Appendix 2 Section 2.2.2 and the information collected can be found in (add in reference to results section later). A more detailed description of this objective's method can be found in Appendix 3 Section 3.2 with methods of survey dispersal in Section 3.2.1.

3.3 Objective (3): Identify how different organizations operate in their role of environmental conservation and preservation in Nantucket.

We reviewed how other environmental and conservation organizations on Nantucket implement their strategic goals and plans in relation to land use and property management. This enabled us to understand better how the LLNF is similar to or different from these other organizations and what niche the LLNF might occupy in the future. To identify how other prominent land conservation and preservation organizations utilize their properties and work in collaboration with the LLNF, we performed three tasks:

1. Background research
2. Visited select properties owned and managed by the other organizations
3. Interviewed key staff members

Once the background research and interviews for the organizations were completed, we compiled all the notes and used that information when compiling the comparisons between the LLNF and other nature conservation and preservation organizations on Nantucket, as well as our recommendations. During the same time, we were scheduling and conducting interviews while we visited properties owned by the NCF, NLB, and Mass Audubon. During these self-guided tours, we compiled data about each property to more easily compare it to the LLNF property. The information gathered from this process was summarized in Table 4 of the Findings section 4.1.3. A more detailed description of our methods for this objective can be found in Appendix 3 Section 3.3.

3.4 Objective (4): Review the content, structure, and purpose of the LLNF's draft master plan to make recommendations.

Based on the findings of Objectives 1 through 3, we have created a structured set of recommendations for the LLNF's future master plan. These recommendations are based on current LLNF goals and objectives, stakeholder viewpoints, and other organizations' environmental conservation and preservation goals. The recommendations will not only prioritize future actions but also provide insight into potential new ideas that have been overlooked in the planning process. The findings of this research aim to increase community engagement with the foundation and develop a sense of individuality in comparison to the other environmental conservation and preservation organizations on Nantucket.

4. Findings, Conclusions, and Recommendations

4.1 Findings

This section presents our findings from our completed method objectives explained above. We begin by summarizing the results from our master plan survey. We then show the comparison data we collected while touring other conservation organizations' properties. We summarize these findings, along with the responses we obtained through the various interviews, in a set of conclusions. Based on our data, explanations, and summaries, we then present a list of recommendations for the Linda Loring Nature Foundation regarding actions that should be prioritized from their draft master plan. We also cover recommendations for new ideas, projects, physical additions, and outcomes that should be included in the next version of their master plan.

4.1.1 Master Plan Survey Results

There were a total of 209 responses to the survey and respondents were asked to identify their affiliation to the LLNF. Since respondents were allowed to select their affiliation in more than one of the categories provided, there were a total of 345 responses as shown in Table 3. Demographic information collected on the respondents is shown in Figures 11-13.

Table 3. Breakdown of Stakeholder Groups Among Respondents

Stakeholder Group	Number of Responses	Percentage
Member of the General Public	112	32.5%
Recreational User	80	23.2%
Educator (Teacher, Counselor, Etc.)	41	11.9%
Adult Educational User	18	5.2%
Student (Secondary and Postsecondary)	0	0.0%
Parent/Guardian/Caregiver	44	12.8%
Research Collaborator	5	1.4%
Neighbor	21	6.1%
Climate Change Collaborator	10	2.9%
Past Intern/Volunteer	5	1.4%
Other	9	2.6%
Total	345	100%

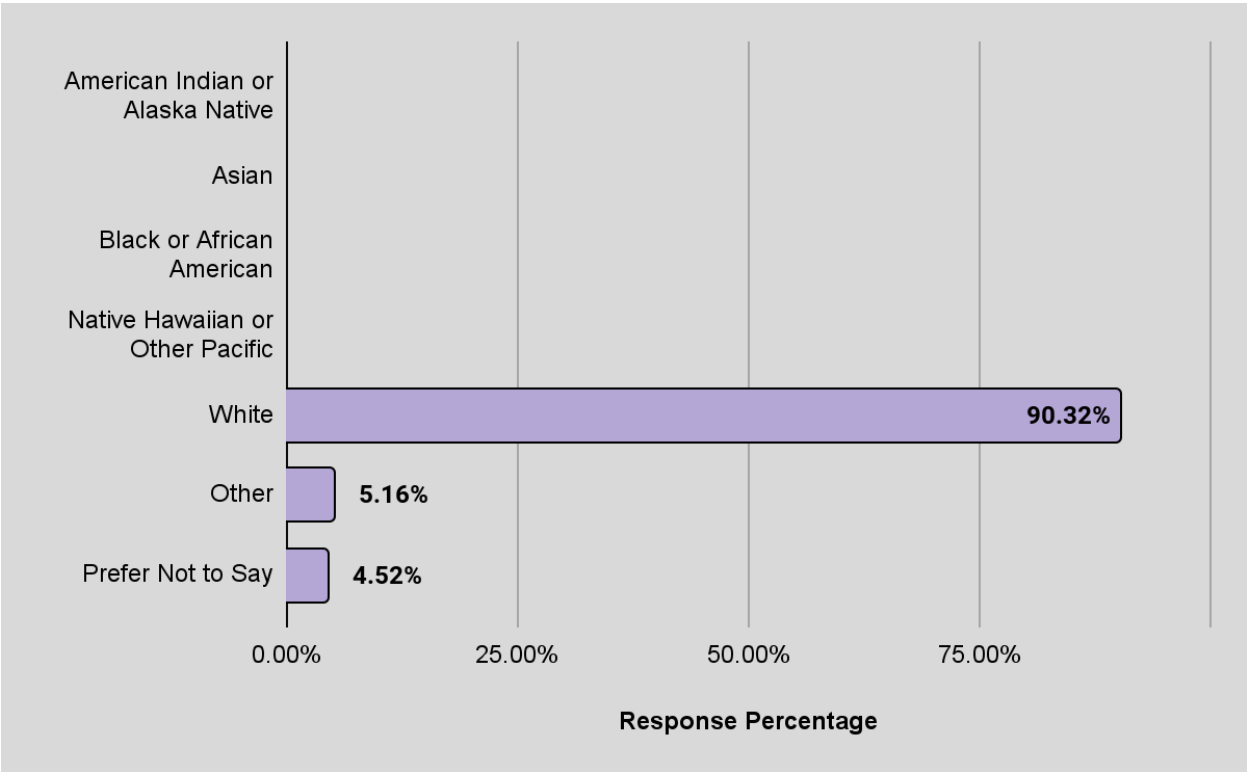


Figure 11: Distribution of Ethnicity Among Survey Respondents (n = 155)

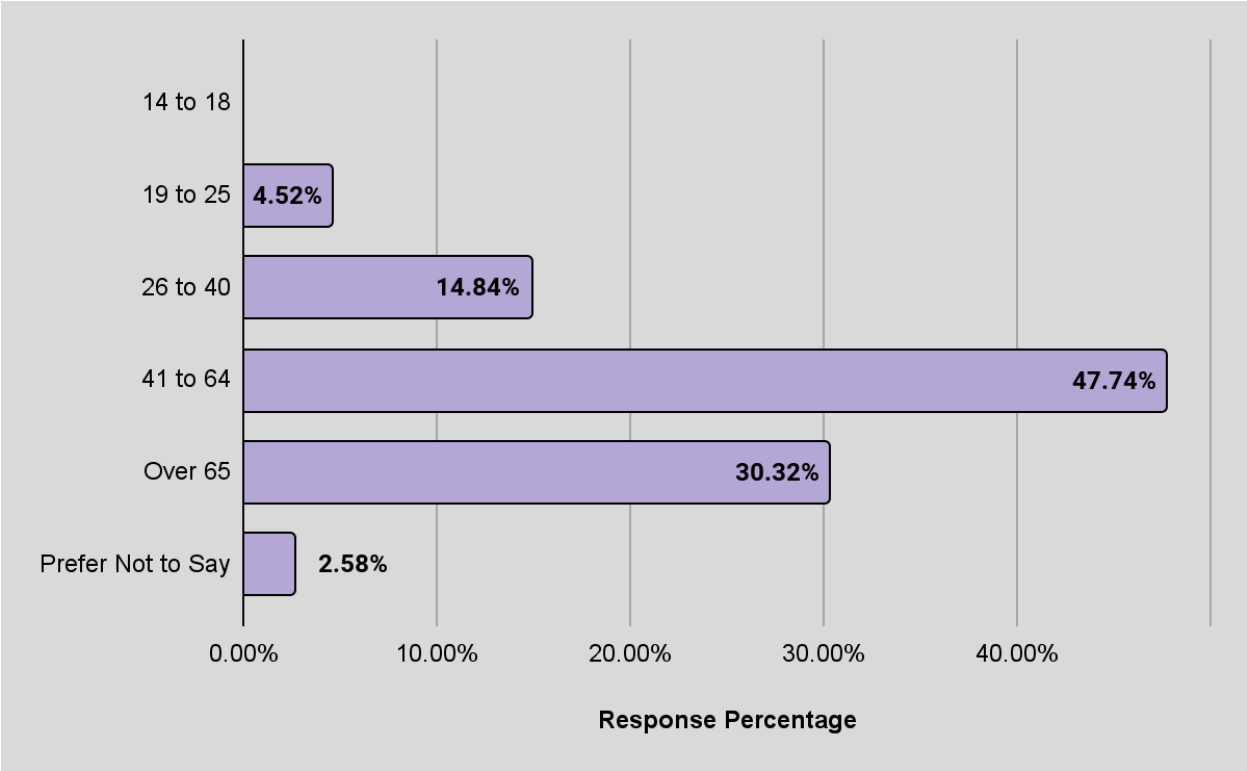


Figure 12: Age Distribution Among Survey Respondents (n = 155)

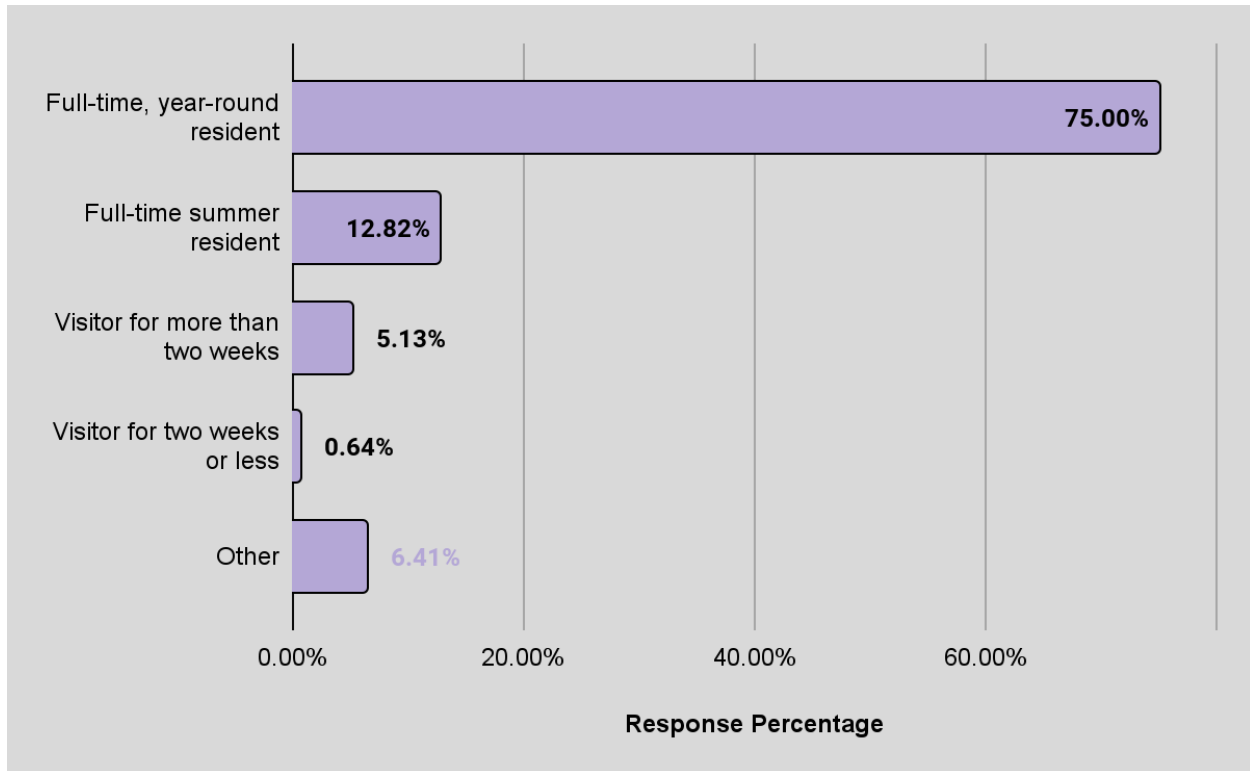


Figure 13: Nantucket Residency Distribution Among Survey Respondents (n = 156)

Of the 56 respondents who had never been to the property and 23 who rarely visit, 29 (36.7%) identified unfamiliarity with the organization as a reason for not visiting the LLNF property. 28 (35.4%) also cited not having enough time to visit the property, and one respondent commented on this saying, “Frankly I wish I had time to participate in more of the current options!” Fifteen additional respondents indicated that the LLNF not allowing dogs on their property was another reason for not visiting. Four other respondents indicated for themselves that walking accessibility would be a barrier as well.

One hundred twenty-one respondents indicated they had visited the property at least once before. Among these respondents, 44.1% indicated they utilized the property for walking the trails, 19.9% for bird watching, and 14.4% for educational programming. Similar results were seen when respondents were asked to identify activities and programs they previously participated in at the LLNF: 37 respondents (13.3%) out of 279¹ total responses indicated they

¹ The number of total responses being greater than the total number of survey respondents indicates the question asked to collect this data was one where respondents could select multiple options.

previously participated in story walks, 32 (11.5%) attended school field trips, and 29 (10.4%) attended birding field trips. For future program participation at the LLNF, not just limited to those who have previously participated or visited the property, 92 (10.5%) respondents out of 876² total expressed interest in biodiversity walks, 92 (10.5%) in birding field trips, 82 (9.4%) in Long Pond kayak tours, and 71 (8.1%) in adult workshops. In addition to current LLNF programming, one respondent suggested developing “future programs on climate change and [its] impact on Nantucket.” Four other respondents suggested advertising programs and/or activities that are either low in cost or free to participants. For students, local educators who had previously visited the LLNF property suggested creating more internship, volunteering, and research opportunities where students could get involved in “hands-on investigations.”

Respondents who had visited the property at least once rated the condition of the trails as follows in Figure 14 below.

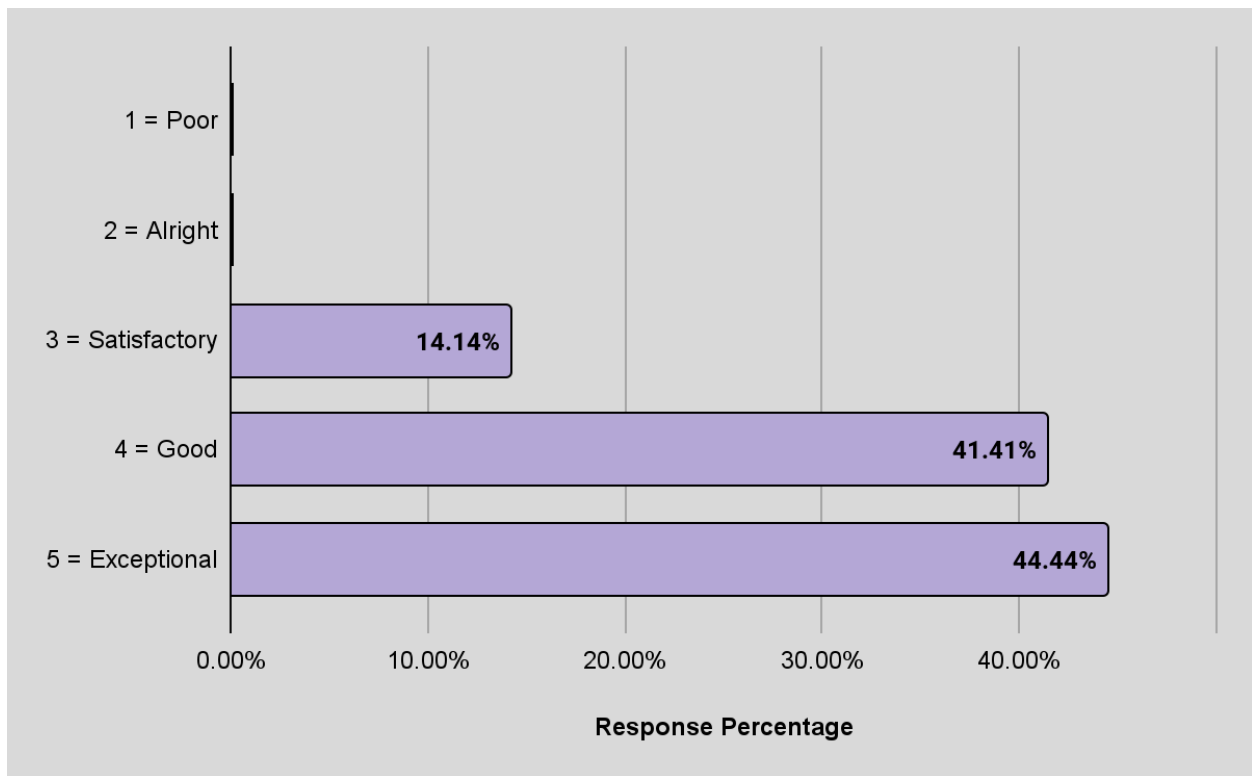


Figure 14: LLNF Overall Trail Ratings (n = 99)

² The number of total responses being greater than the total number of survey respondents indicates the question asked to collect this data was one where respondents could select multiple options.

Although 85 (85.85%) respondents rated the trails as either good or exceptional, one respondent commented that the end of the path at Fisher’s Landing is in need of maintenance and three were interested in having longer trails. In terms of accessibility, the LLNF trails were rated as either satisfactory or good by a combined total of 73/110 (66.4%) respondents while another 31 (28.2%) gave a rating of ‘exceptional’ meaning there were no restrictions to using the trails. Respondents suggested that possible changes the LLNF could implement to increase accessibility could include “a few more simple benches for resting along the trails” and making the trails more accessible to “those who need walkers or wheelchairs.” When asked about the addition of more specific trail features, quiet points of solitude were prioritized most among 45 respondents out of 91 followed by access to points of interest, scenic vistas, and wetland vistas. The breakdown of interest in trail features is shown in Figure 15.

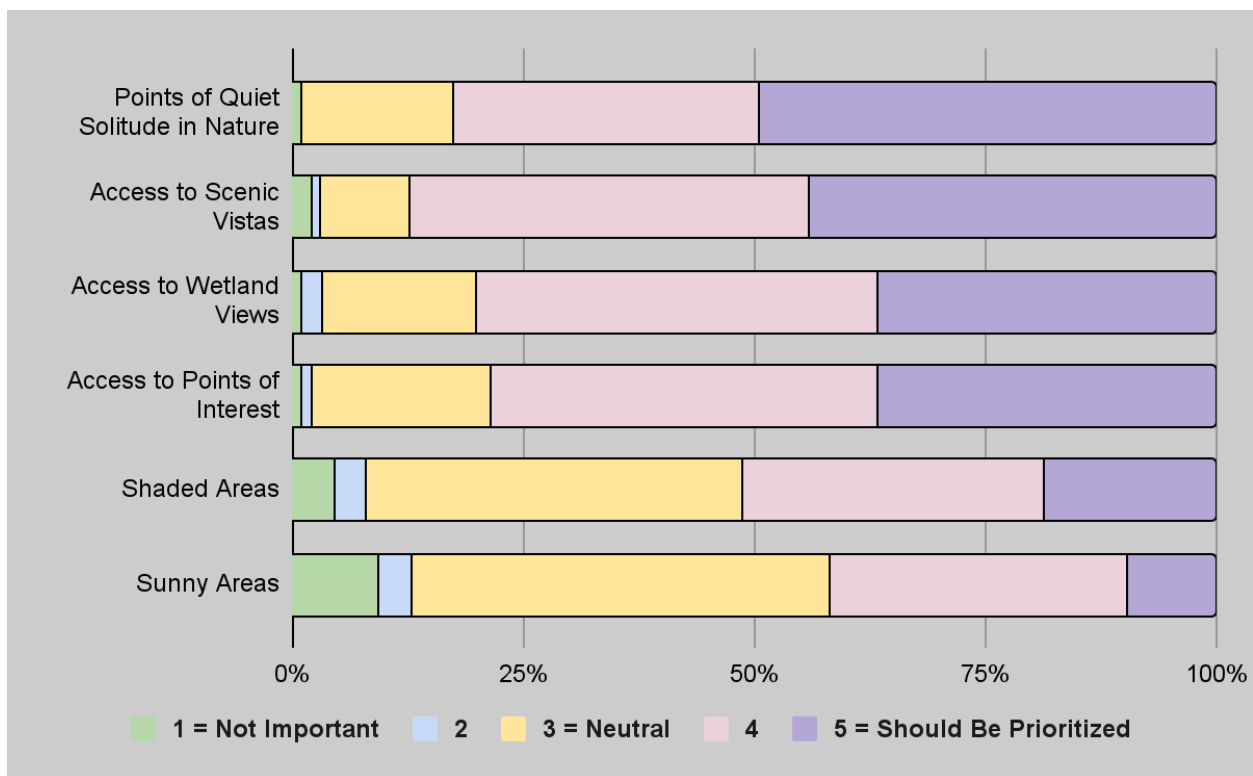


Figure 15: Prioritized Trail Features at LLNF (n = 99)

One hundred fifty-one people responded to the question regarding possible additions to the LLNF property (Figure 16).

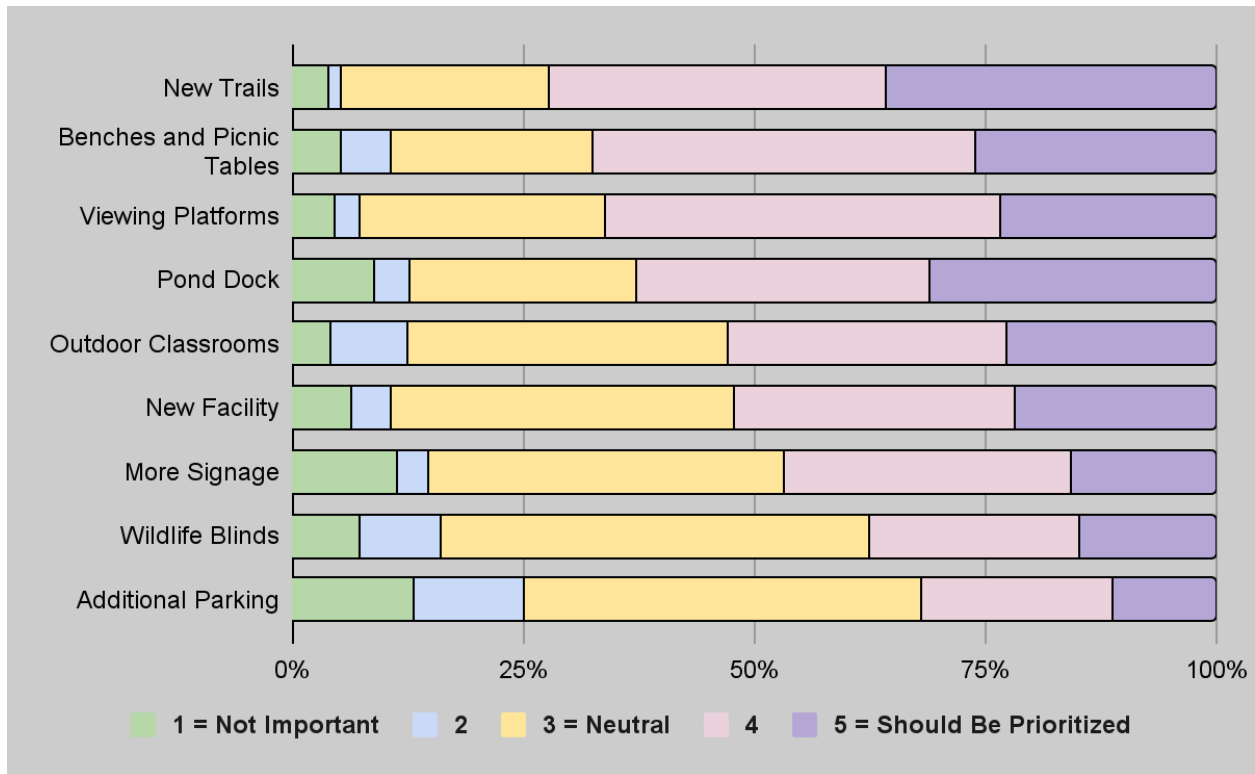


Figure 16: Prioritized Additions to LLNF Property (n = 151)

New trails were suggested by 54 respondents out of 151³ total responses as a top priority. In a question directly asked to past interns and volunteers, one respondent stated that “intern housing would greatly help interns who would like to have the job but cannot afford Nantucket rental prices.” Three respondents, including past educators who collaborated with the LLNF, commented on the size of the parking lot not being suitable for buses to turn around; as one respondent stated, increasing the size of the parking lot “would allow school [buses] to access the property better.”

Respondents provided ratings on current interpretive materials as shown below in Figure 17.

³ The number of total responses being greater than the total number of survey respondents indicates the question asked to collect this data was one where respondents could select multiple options.

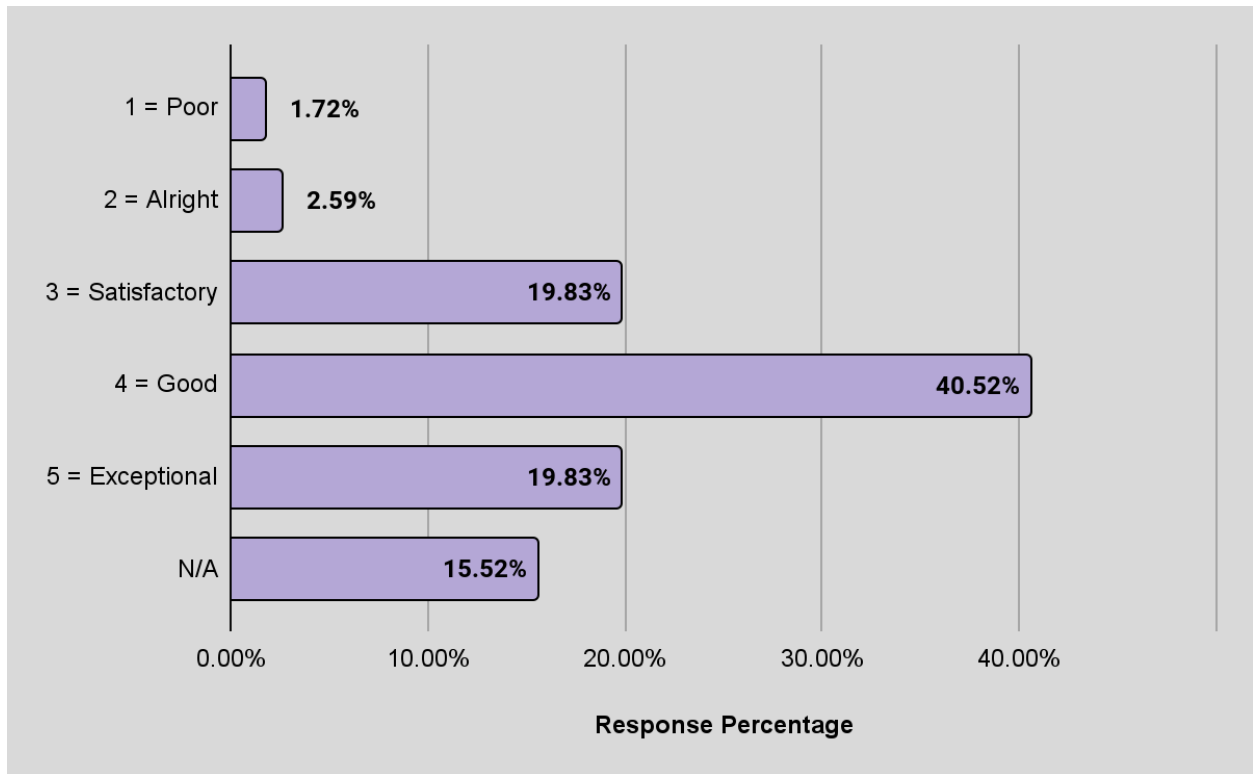


Figure 17: LLNF Interpretive Materials Ratings (n = 116)

Forty-seven (40.5%) respondents rated the interpretive materials currently offered by the LLNF as good, but not exceptional; 5 (4.3%) thought the materials were in need of improvement.

Figure 18 shows the full distribution of responses in terms of what types of interpretive materials the LLNF should prioritize. Along the trails, 102 out of 142 respondents identified a need for and interest in updating trail markers (71.8%), informative descriptions of the flora and fauna around the property (84.0%), and markers for viewing areas (77.8%).

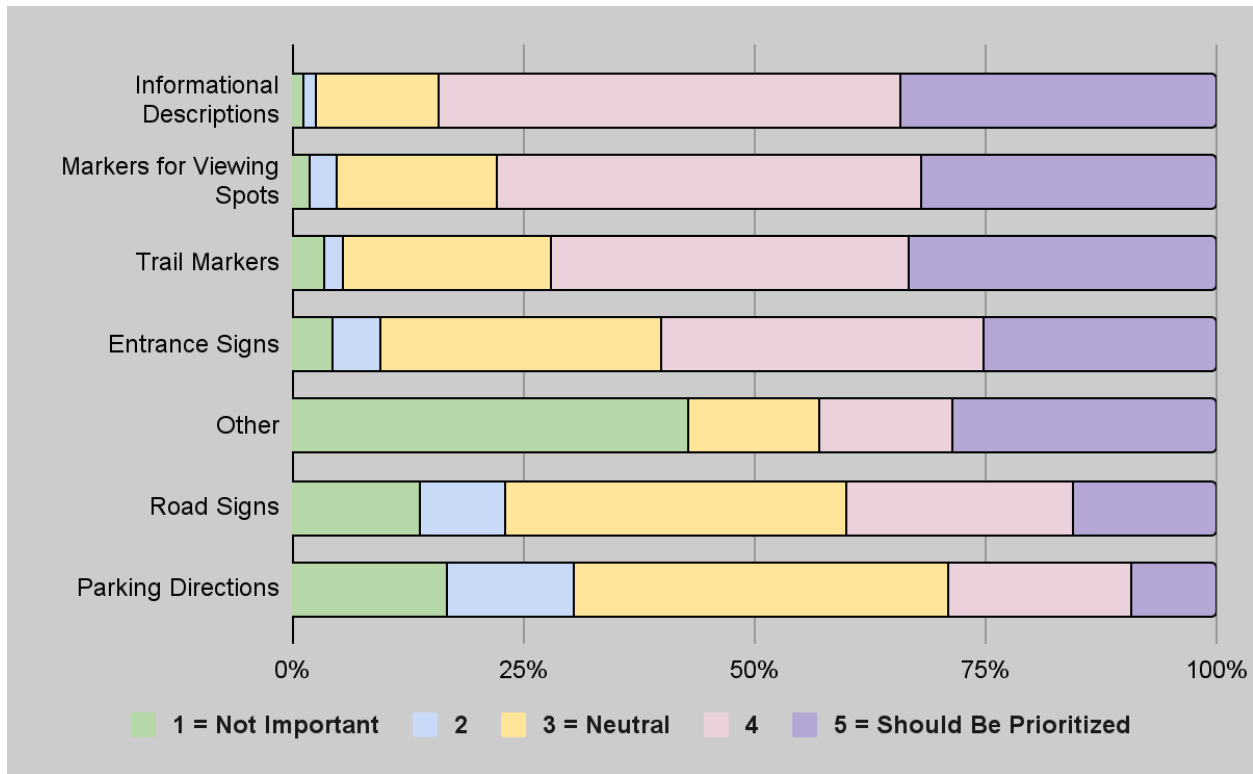


Figure 18: Prioritized Interpretive Materials (n = 144)

In terms of updating interpretive materials, 124 respondents out of 148 identified physical signage around the property as preferable. Fifty-two out of 125 respondents indicated that they did not prefer paper handouts and 59 of the same 125 respondents felt neutral about this form of informational delivery. The concept of using QR codes around the property received neutral responses from 61 (46.9%) out of 130 respondents. When presented with the idea of developing a downloadable app for the LLNF, 59 (45.7%) out of 129 respondents expressed a preference for a downloadable app.

In terms of community perception of the LLNF and similar organizations on Nantucket, Figure 19 shows the 498⁴ total responses for when respondents were asked to identify the top three organizations on Nantucket they associate with education. Approximately thirty percent identified the Maria Mitchell Association as the organization most closely associated with education followed by 22.9% who identified the Linda Loring Nature Foundation and 18.3% who identified Nantucket Conservation Foundation.

⁴ The number of total responses being greater than the total number of survey respondents indicates the question asked to collect this data was one where respondents could select multiple options.

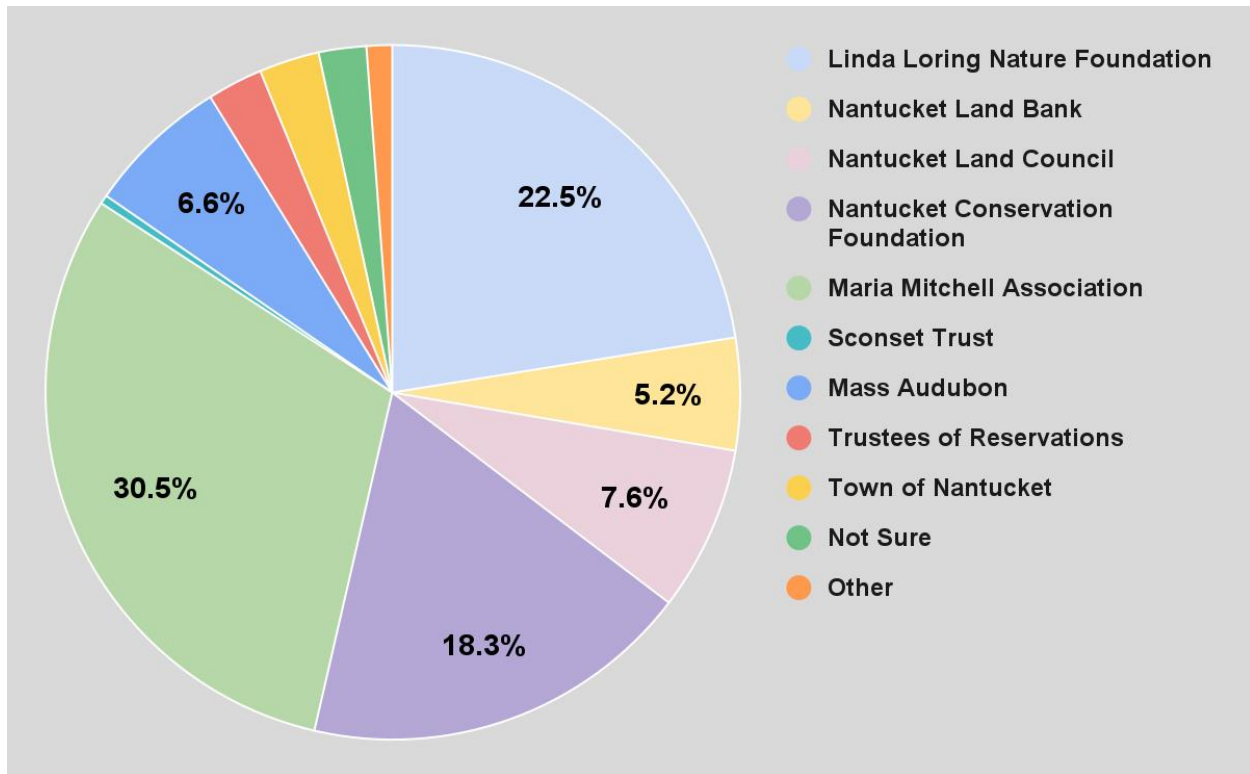


Figure 19: Organizations Associated with Education on Nantucket (n = 498)

For leaders in the field of research, Figure 20 shows the 474⁵ total responses for when respondents were asked to identify the top three organizations that come to mind. Approximately twenty-three percent identified the Maria Mitchell Association as the organization most closely associated with research opportunities and collaboration followed by 21.5% who identified the Nantucket Conservation Foundation and 20.5% who identified the Linda Loring Nature Foundation. Although not listed as an option, five respondents listed the UMASS Field Station as a leader in this respect as well.

⁵ The number of total responses being greater than the total number of survey respondents indicates the question asked to collect this data was one where respondents could select multiple options.

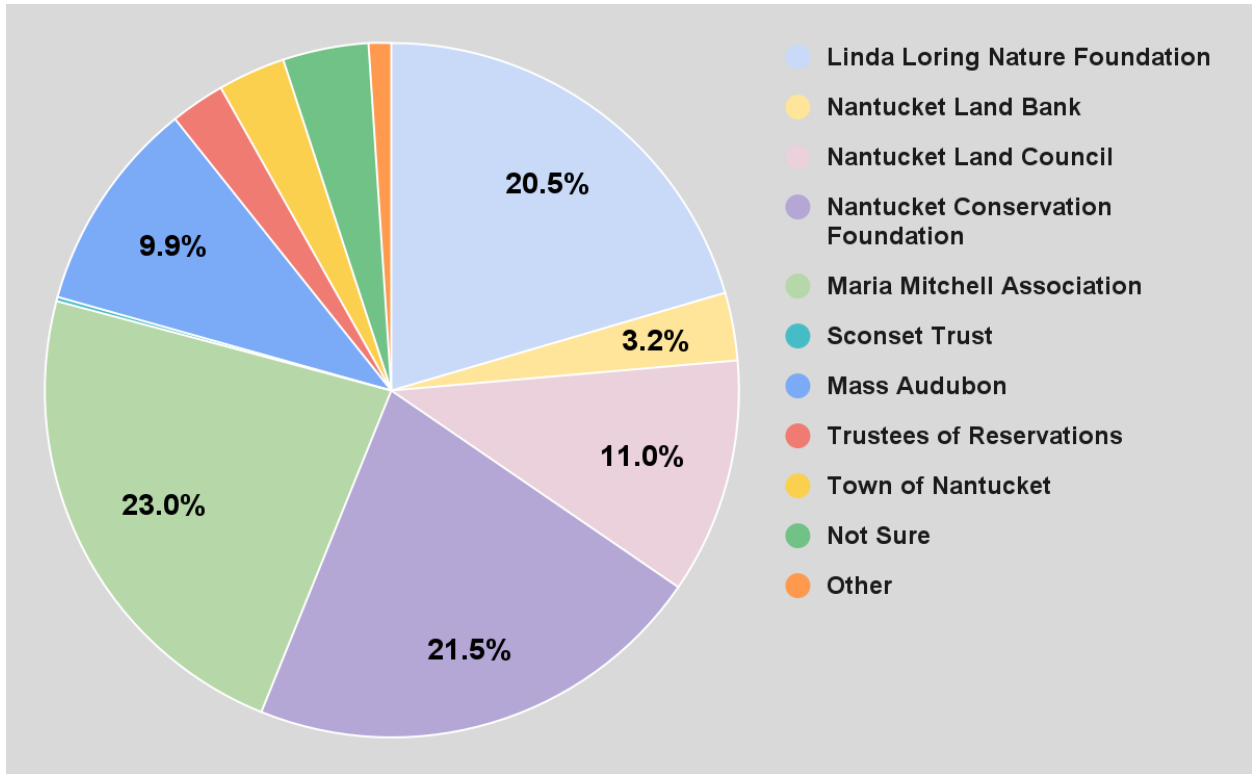


Figure 20: Organizations Associated with Research on Nantucket (n = 474)

For property maintenance practices, Figure 21 shows the 522⁶ total responses collected when respondents were asked to identify the top three organizations most associated with land management. Approximately thirty percent identified the Nantucket Land Bank as the organization most closely associated with maintaining their properties followed by 26.1% who identified the Nantucket Conservation Foundation and 13.6% who identified Nantucket Land Council.

⁶ The number of total responses being greater than the total number of survey respondents indicates the question asked to collect this data was one where respondents could select multiple options.

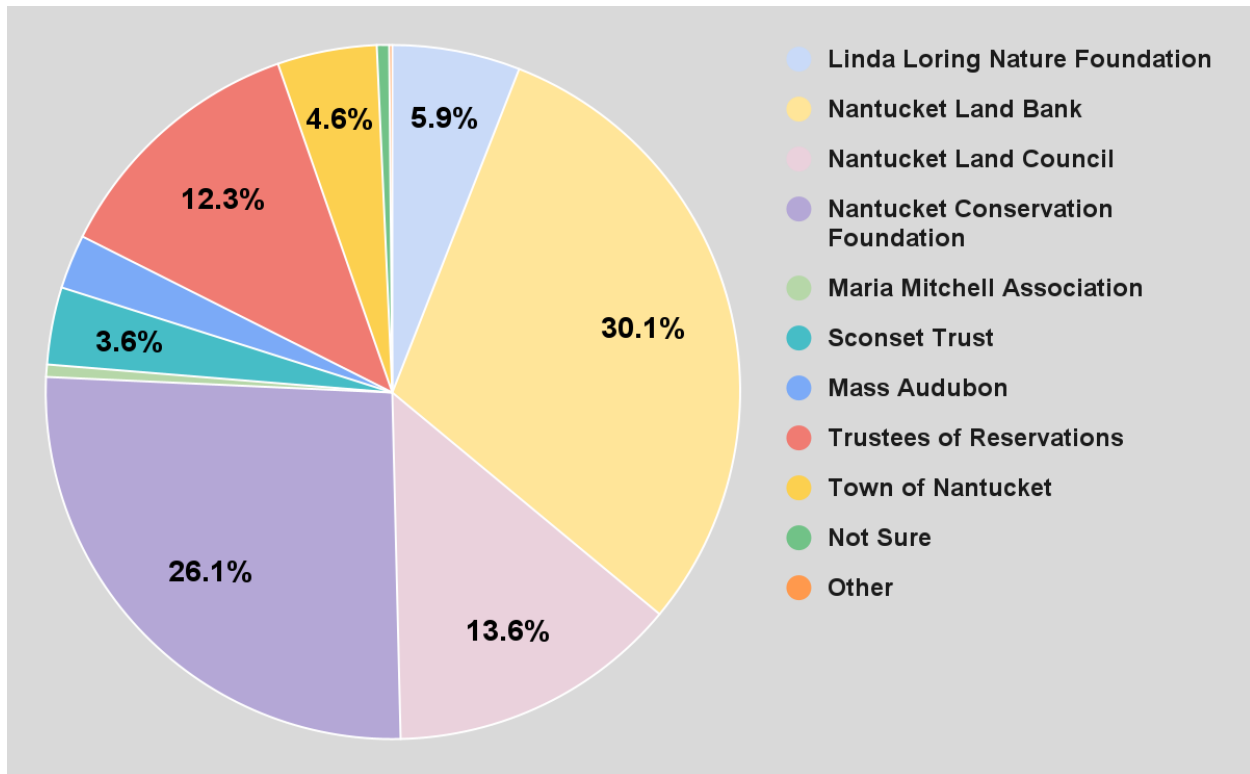


Figure 21: Organizations Associated with Land Management on Nantucket (n = 522)

To feel more welcomed at the LLNF property, five survey respondents from the members of the general public, recreational user, and adult educational user stakeholder groups felt it was important to be greeted by LLNF staff at a welcoming facility and similarly be made more aware of events and programs taking place on the property. One respondent noted “employees [should] smile and welcome all visitors, members or not” to the property, and another respondent suggested the LLNF “make it more friendly to the Nantucket public and offer [educational] programs.” Three respondents also suggested creating adult programming or “more virtual programs for seniors” to welcome more individuals to LLNF programming.

Twenty-one respondents indicated that the LLNF could improve on its outreach and communication efforts to make more members of the Nantucket community aware of ongoing events and programs taking place. Suggestions ranged from posting more upcoming events on social media to establishing “strategic advertising and partnerships with broader communities.” One respondent summed up the importance of outreach to the Nantucket community by commenting, “Outreach is critical to building public relationships and offerings however that can be developed.” For those unfamiliar with the LLNF, a past educator suggested making “a video introducing the facility and programs in multiple languages.” Further efforts suggested by

respondents to increase inclusivity at the LLNF included outreach to underrepresented groups, multilingual translations in interpretive materials, and previous testimonials from those involved with the foundation.

4.1.2 Interview Findings

The following findings are summaries of interviews which were conducted with stakeholders who have various associations with the LLNF. These interviewees provided us with insightful perspectives on potential actions of the master plan as well as knowledge in their related field of expertise.

4.1.2.1 LLNF Senior Board Member & Past Intern

Senior Board Member

From our interview with a Senior Board Member of the Linda Loring Nature Foundation (LLNF), we acquired insight into the board's perspective of the draft master plan from creation to its final outcome. His work as member of the LLNF Board began after founder Linda Loring passed away in 2019, and involved general oversight with the ultimate responsibility for managing the logistics of programs, staff, endowment, and implementation of the master and strategic plan. From the Board's perspective, an important aspect of the new master plan's development was to focus on attempting to purchase abutting residential property in order to secure an envelope to build new facilities on. This was due to the original building envelope being within the boundaries of the new parcel of land where climate change-related flooding would occur in 2100. Information and opinions on such matters were solicited from the climate change collaborators and the master planning committee, as the master plan was primarily developed by the LLNF staff. The Senior Board Member indicated that a potential measure of the master plan's success would be if the foundation was recognized by peers around the country as a research center. Funding for this new plan will require a large community campaign as well as donations from prominent community members. Looking towards the future, he mentioned ideas for new high school research programs and staff positions that would be beneficial to identify as final recommendations to our sponsor. He also went on to indicate that a potential measure of the master plan's success would be "to be recognized as a research center by peers around the country."

Issac Hersh

From our interview with Isaac Hersh, a former LLNF intern, we learned more about the internship experience provided by the LLNF. Overall, Hersh expressed nothing but positive remarks about his internship experience and enjoyed being a part of numerous events and projects taking place around the property. The majority of Hersh's work was outdoors where he gained valuable experience with fieldwork including land maintenance, phenology, and data collection on various nature studies. Hersh found that the skills he developed during his four months with the LLNF were valuable even if the fieldwork was not necessarily applicable to his current field of interest. Housing was not an issue for Hersh during his internship; however, he did acknowledge that finding seasonal housing in the summer is a large problem on Nantucket, especially for internships. Hersh noted that if on-site housing was provided for interns it would open the opportunity for lots of people who want to participate in the internship opportunity. When asked to describe what sets the LLNF apart from other organizations on Nantucket, Hersh immediately responded by saying the land itself. Hersh believes that the size of the property allows the LLNF to decide how to do programming in a way the staff desires. More programming geared towards adults such as birding tours was suggested by Hersh as a way to get more community members involved with the foundation. Hersh additionally recommended that the LLNF advertise their programs and activities to help distinguish themselves from other organizations on the island, especially during the summertime when most residents are present on the island.

4.1.2.2 Education Collaborator

Matt Liddle

From our interview with Matt Liddle, a current teacher at Nantucket New School and past board member for the Linda Loring Nature Foundation, we gained valuable insight from an educator viewpoint. Matt spoke strongly about expeditionary learning and strengthening PreK-12 programs to specifically target a younger audience. He believes LLNF is more than capable of doing so with the property and personnel they possess. Having collaborated with LLNF in the past with his students, he has been more than satisfied with the educational programs they

participated in such as gardener snake research, phenology studies, birding, and more. The only barriers to doing such programs were the sheer logistics of being able to get a bus out to the property, as accessibility by that mode of transportation is not easy with the setup of the parking lot. Matt also went on to mention how he would really like to see a dock installed for aquatic experiences, as well as a multi-use nature center facility which he felt would completely set LLNF apart from those similar to it. When asked, what makes LLNF unique in comparison to other organizations as it stands? He proclaimed that the land along with the people who operate it, is what currently differentiates the foundation from others alike.

4.1.2.3 Accessibility Collaborators

Mickey Rowland and Brenda McDonough

During our interview with Mickey Rowland and Brenda McDonough, from the Nantucket Commission on Disability, we discussed the accessibility of open spaces, and potential ways the LLNF can improve their own accessibility of the property. First, Rowland and McDonough shared how a new Land Bank property, Creeks Preserve Park, had been expertly designed to be as accessible as possible; McDonough proclaimed how a highlight of the development was “wheelchair accessibility, that was on the front burner when they were designing this property.” The commitment the Land Bank had made to ensure this new property would be accessible to any user is something the LLNF should work to emulate. Aspects of a property that must be prioritized when promoting accessibility are trail surfaces, parking spaces, benches and picnic tables, ramps to elevated platforms, and interpretive materials such as signage and trail markers. Many physical alterations to the LLNF property are not possible without permits due to the detail of their conservation restrictions, which should be kept in mind for future considerations. LLNF must acknowledge, “it really comes down to surfaces,” as Rowland mentioned numerous times while discussing what is most important when blending accessibility with open spaces. Another potential barrier for the general public to use the LLNF property that had been discussed was the unpaved section of Eel Point Road. Rowland suggested that regular road maintenance, such as grading, could potentially invite more visitors to the property as well. A final emphasis was made by McDonough, “to promote accessibility, you have to be accessible.”

4.1.2.4 Conservation Partners

RJ Turcotte

From our interview with RJ Turcotte, the Resource Ecologist at the Nantucket Land Council (NLC), we gained comparative insight on how a different conservation organization operates and functions on Nantucket. The NLC functions by upholding and enforcing the conservation restrictions (CRs) of the land they acquire; however, since their staff is limited, they transfer ownership of the land to larger organizations with the ability to maintain the property. This organization holds and conducts programs differently than the LLNF, given the unique nature of its operation. Collaboration with other organizations, like the LLNF, the NCF and the NLB, is often vital to the NLC's ability to host educational or research programs since those organizations own the land. With that being said, the NLC also offers smaller programs that do not require the ownership of certain properties, like their Tree Tours which provide historical facts about the local trees in town. Turcotte also explained how the NLC primarily works with volunteers but did not hire their first intern until 2019. The issues he expressed for providing their intern with housing were the same as the LLNF's: finding housing on Nantucket has proven to be very difficult for these organizations. Turcotte also mentioned, like the LLNF, the NLC has recently reevaluated its strategic plan. They believe frequently updating a strategic plan is a useful way to measure the success of the organization and to ensure they are on track with their goals. This information was valuable for our understanding of how the LLNF differs from the other conservation organizations on the island. Because Turcotte is a waterkeeper for the NLC and specializes in ecology and water quality, he was able to list many possible ideas he had for potential new educational and research programs the LLNF could incorporate into their new access to wetlands and Long Pond.

Rachael Freeman

In interviewing Rachael Freeman, the Environmental and Agricultural Coordinator for the Nantucket Land Bank, we obtained an additional perspective on the inner workings of another conservation organization on Nantucket. We discussed the logistics of her role with the organization; she mentioned how she works with project managers to suggest the environmental components of new NLB developments as well as compiling the necessary permits for such projects. Additionally, our team was made aware of the rather extensive process of creating new

trails. The idea for a new trail is typically initialized by a member of the community; the NLB then has to take into consideration environmentally sensitive points on the property along with abutting ownership. If all goes well, the Land Bank then determines the best possible location for the trail with their staff and crew. Once this is complete, the proposition is brought to the commissioners. If the proposition is accepted, the Land Bank begins the process of creating the trail. There is a similar process to creating new signage although it has to first be approved by the Historic District Commission. We were also informed on the small number of maintenance staff members at this organization as well as the process in which they elect new commissioners to serve three year terms. Unlike the LLNF, this organization does not focus on research and education; their goal revolves around conservation, recreation and agriculture. When asked about internal staff housing with their organization, Freeman explained how the NLB is fortunate to have access to a substantial amount. When asked about the newly opened Land Bank property, Creeks Preserve, Freeman expressed her fondness of the property and explained how it is not only accessible, but also ecologically conscious with the vast majority of the property being composed of native plant species.

4.1.3 Observations from Site Visits to Other Conservation Properties

Below is information regarding the physical aspects of different conservation organization properties around Nantucket. Table 4 and the subsequent text summarize aspects of each property worth noting to compare with the LLNF property. The sections of photos (Figures 22 to 34) shown below the table are examples of the most important features from certain properties we visited; however, not all properties are present under each subsection of photos.

Table 4. Conservation Organization Property Comparison

Locations	LLNF	Tupancy Links	Sanford Farm	Gardner Farm	Squam Swamp	Squam Farm	Creeks Preserve
Owner	LLNF	NCF	NCF	NLB	NCF	NCF	NLB
Property Acreage	~ 275 acres	~ 70 acres	~ 133.5 acres	~ 41 acres	~ 200 acres	~ 304 acres	~ 9 acres
Parking Capacity	~ 14 cars, 1 lot	~ 20 cars, 2 lots	~ 10 cars, 1 lot	~ 19 cars, 2 lots	~ 7 cars, 1 lot	~ 10 cars, 1 lot	-13 cars w/ 1 handicap spot, 1 lot
Trail distance	- 1 mile - Big and small loop	- 2-3 miles - Big and small loop - Trail to bluff over ocean	-6-7 miles -Big ocean loop and two smaller loops	- 4-5 miles trails - A few big loops, several small loops	- 1.8 miles -One loop connecting to Squam Farm	- 1.5-2 miles -Big loop with a few smaller loops connecting to Squam Swamp	~ 0.25 mile loop
Trail types	- Mown grass	- Gravel - Mown grass - Sand trail to the ocean	- Gravel - Mown grass	- Sand/dirt - Bridge	- Gravel - Dirt - Bridges	- Mown grass	- Concrete
# of Benches	3	4	5	4	3	0	3 Benches 3 Picnic tables
Prohibited activities	- Hunting - Bikes - Horses - Dogs - Smoking	- Hunting - Bikes - Horses - Camping - Motor vehicles	- Motor vehicles - Camping - Hunting	- None posted (No kiosk)	- Motor vehicles - Bikes - Horses	- Motor vehicles	-Motor vehicles
Signage	- Wooden posts with metal numbers	- All weather plastic with bird deterrent oriented towards the described feature	- All weather plastic with bird deterrent oriented towards the described feature - Posts with arrows to trails/trail mileage	- Wooden posts with arrows to the trails	- Wooden posts with yellow plastic numbers and arrows to the trails/trail mileage	- All weather plastic with bird deterrent oriented towards the described feature	- Sign at gate explaining to how gain access to handicap van parking
Main habitat types	- Grasslands - Heathlands - Shrub swamps - Pine forest - Vernal pools	- Grasslands - Pine forest - Dune landscape - Ocean cliffs	- Grasslands - Heathlands - Shrub swamps - Pine forest - Dunes - Ocean beach - Salt marsh	- Grasslands - Heathlands - Pine forest - Wetlands	- Hardwood forest - Flowing streams - Vernal pools	- Grasslands - Heathlands - Hardwood forest - Vernal pools	- Native meadow - Grass field - Sparse woodlands - Shrubs
Time to walk trails	- 30 mins on 0.93 mile loop	- 36 mins on 2 mile loop	- 3 hours on 6 mile loop	- 45 mins 1 mile loop	- 30 mins on 1.8 mile trail to Squam Farm	- 30 mins on 1.5 mile trail to Squam Swamp	-15 min on 0.25 mile loop
Water Access	No	No	Yes- Ocean beach	Yes- Hummock Pond	No	No	Yes- Ocean marsh
Public Facilities	No	No	No	No	No	No	Yes- Portable Toilet
Bike Rack	Yes	Yes	Yes	No	No	No	Yes

When visiting each of the properties mentioned in Table 4, the team recorded relevant property features so that we could make direct comparisons to the LLNF property regarding topics from the master plan. When comparing the acreage of these properties, we noticed that the LLNF property was among the largest of the properties we visited. We discovered that property parking lots drastically varied in size while also being smaller than we expected. However, the LLNF offers a parking lot with a capacity more than twice that of Squam Swamp and Squam Farm, which have the most similar property acreage. Another observation worth noting: several properties, such as Gardner Farm and Squam Swamp/Farm, did not offer any place to rack bikes, as reflected in Table 4.

We found that a larger property size did not always result in longer trail distance; at the seven properties we visited, the opposite trend occurred. With Creeks Preserve as an exception, the largest properties have trails around one to two miles in length, while smaller properties have between two and seven miles of trails. There was a general consensus that looping trails are most convenient and desired by property users, as each visited property somehow implemented a loop into their trail systems. However, Tupancy Links and Gardner Farm are examples of properties that used both loop trails and separate paths to locations of interest.

Comparing the trails revealed that the materials used to develop trails depended more so on the ecology of the property, rather than the preference of the organization in ownership, as can be seen in the Figures in Section 4.1.3.1. When comparing the different properties, the team felt that the LLNF's trail surface was well maintained while avoiding the use of abrasive materials such as gravel, stone dust, or concrete. Creeks Preserve was the only visited property that incorporated accessibility into their entire trail systems. Likewise, while the presence of a few benches occurred at the majority of the properties, Creeks Preserve was the only to accommodate wheelchairs access at these features (Figure 33 and 34). Subsequently, that was the only property to provide a public facility in any form, referring to publicly accessible toilets or buildings. One of the most important aspects worth noting when comparing prohibited activities is that the LLNF is the only property to not allow the combination of dogs, horses, and bikes. This is due to the legally binding conditions of the LLNF's conservation restrictions. The signage and trail marking system at the LLNF property is not quite as informative as the all-weather signage at NCF properties (Figures 28) or as noticeable as the trail markers from Squam Farm (Figure 29). Even though the LLNF is one of the properties without direct access to water

as seen in Table 5, it should be noted that their property does abut the North Head of Long Pond and future dock access to it is under serious consideration. As seen in Table 4, each property has a unique combination of habitat types, however, it was Tupancy Links, Sanford Farm, and Gardner Farm that come the closest to resembling the ecology at the LLNF.

4.1.3.1 Trail Types



Figure 22: Tupancy Links Trail (NCF)



Figure 23: Sanford Farm Trail (NCF)



Figure 24: Creeks Preserve Trail (NLB)



Figure 25: LLNF Trail

Out of the various trail types we encountered, due to the nature of Nantucket, most trails were mowed-down sandplain grasslands as seen above at Sanford Farm (Figure 23) and the LLNF (Figure 25). As we got closer to the ocean at properties such as Tupancy Links or Sanford Farm, the trails consisted of sand and gravel. One particular property we visited, Creeks Preserve Park, was entirely wheelchair accessible. The entire walking loop at Creeks Preserve was made of concrete and entirely wheelchair accessible, enough so to fit two

wheelchairs side by side (Figure 24). We found that some trails were more accessible than others. Trails like the ones at the LLNF and Tupancy Links were well maintained with primarily flat surfaces. While they may not necessarily be wheelchair accessible, they were far more accessibility friendly than some of the uneven, rough areas at Sanford Farm and Squam Swamp.

4.1.3.2 Interpretive Materials



Figure 26: Tupancy Links Kiosk (NCF)



Figure 27: LLNF Kiosk



Figure 28: Sanford Farm Informational Signs (NCF)



Figure 29: Squam Swamp Trail Marker (NCF)



Figure 30: LLNF Trail Marker

The interpretive materials and signage were consistent within each organization. The kiosks at the NCF properties provided information about that specific property including historical information, the flora and fauna present, the property restrictions, a trail map, and a physical brochure. Some of the NCF kiosks were also translated into Spanish on the backside. The LLNF's kiosk provided similar information but was not translated into other languages. We found that the NLB properties did not provide informational kiosks. As for informational signage on the trails, the NCF had the best in both content and structure. Their signs provided information about the flora and fauna along the trail, as well as directional arrows and distance for the rest of the trail; these signs were also weather resistant. This was the only organization that provided informational signs of this caliber. However, at one NCF property, Squam Swamp, they provided wooden trail markers with numbers that went in correspondence to information found in their brochure (Figure 29). This is similar to the LLNF property, however, the Squam Swamp markers were brighter and more visible.

4.1.3.3 Bridges



Figure 31: Gardner Farm Wetland Bridge (NLB)



Figure 32: LLNF Proposed Wetland Bridge

In order to observe how a bridge over wetlands was incorporated at a different property, we visited Gardner Farm. This bridge was not necessarily a design the LLNF is aiming for, but it essentially serves the same purpose the LLNF needs to merge their two properties. The bridge at Gardner Farm had a grated surface, which worked well for that particular property; however, the wooden bridge featured in the LLNF draft master plan fits better aesthetically at the LLNF property.

4.1.3.4 Seating



Figure 33: Creeks Preserve Bench (NLB)



Figure 34: Creeks Preserve Picnic Table (NLB)

While all of the properties toured had seating, Creeks Preserve was particularly valuable for us to visit. This property is outfitted with three benches and three picnic tables, one of each being fully wheelchair accessible. Both the accessible bench and picnic table were situated on

top of extensions off the concrete trail. This allows wheelchairs to be moved up next to each seating element.

4.2 Conclusions

4.2.1 Master Plan Survey Conclusions

The survey results revealed that respondents wanted to see new trails as the top priority of all of the property additions proposed in the LLNF draft master plan. Respondents also placed less, but still significant importance on the potential installation of viewing platforms, a dock or pier on Long Pond, and benches and tables around the property. Specifically, regarding new trail features, respondents prioritized access to scenic vistas and points of quiet solitude in nature while still showing interest in having access to points of interest and wetland views.

People showed interest in updating the current signage at the LLNF property to include more trail markers, informational descriptions of flora and fauna, and markers for viewing spots; however, it was indicated that there was more of a preference for physical signage posted in the ground as the method of delivery for the information rather than the use of QR codes and a downloadable app.

Accessibility was expressed as a concern by respondents where the overall consensus was that the LLNF property could make improvements to become more user-friendly. It was indicated by individuals that the trails lack the ability to accommodate visitors with mobility issues who may require the use of walkers or wheelchairs. As for the parking lot, respondents identified the layout as a barrier for vehicles accessing the property on school field trips, more specifically the narrow entrance with little clearance for a bus or van to turn.

In terms of future program participation, respondents expressed the most interest in attending birding field trips, biodiversity walks, and Long Pond kayak tours although there were requests for more programming geared towards adult audiences. To accommodate those who are physically unable to visit the property, virtual programming was suggested by respondents as an alternative way to experience the LLNF property. Providing low-cost or free programming for participants, especially of younger ages, was identified as a practice that piqued interest in future program participation from parents and older survey respondents.

Respondents suggested that LLNF should enhance its communications and visibility so that residents are aware of current events and programming through materials posted on the property or at different locations within town, depending on the event. Respondents said they would love to see more things posted on social media platforms such as Facebook and in local newspapers. Spreading the information about programming and events through advertisements and partnerships was another means respondents felt the LLNF could use to spread awareness about the foundation in Nantucket.

4.2.2 Interview Conclusions

Based upon our conducted interviews with various stakeholders, we have come to the conclusion that there are four main areas for improvement with the LLNF. These areas are related to the foundation's depth of staffing, accessibility, programming, and outreach. From speaking with the Senior LLNF Board Member, he identified the increase of maintenance that will come in association with the newly acquired land parcel which could potentially create a need for additional staff. Rachael Freeman built upon this topic having highlighted how the Nantucket Land Bank maintains their properties through the use of hired maintenance staffing. Aside from maintaining the land, making the property fully accessible was an expressed suggestion amongst Matt Liddle, Mickey Rowland, and Brenda McDonough. The property currently has several physical barriers that limit access for those with ambulatory disabilities. This is also the case for general access to the property by buses which cannot maneuver properly due to the entrance and parking lot configuration. Both Matt Liddle and RJ Turcotte expressed strong interest in the educational and research aspects of the LLNF along with a desire for new aquatic programming. To accompany this idea for additional program offerings was the excitement for new facilities such as a nature center to support research and education as mentioned by Liddle. Isaac Hersh went further to proclaim how an expansion of facilities on the property to include intern and researcher housing would be a logical addition considering the cost and shortage of housing on Nantucket, especially during summer. Hersh also thought it would be important for the LLNF to expand their outreach in the community to create more of a separation amongst similar organizations on the island.

4.2.3 LLNF Comparisons

In visiting properties on Nantucket owned and managed by other conservation and preservation organizations, we found some key differences and similarities when compared to the LLNF's property. The following conclusions fueled our physical property recommendations.

We found that the parking lots on average allowed roughly 13 cars. We also noted that most, but not all, had a place to rack bikes. By limiting the amount of parking and access to bike racks, it prevents the possibility of overcrowding. This is typically done at nature preserves to reduce the amount of people on the property at once to better the users' experience as well as lessen the environmental impact on the property. Including data from the survey, parking did not seem to be a legitimate issue for the casual user at the LLNF. Their parking lot is sufficient in most cases except for large events, where it might overflow, or school trips, where a bus is necessary.

The type of trail had a reasonable correlation to the accessibility of the trail. The mown grass trails were mostly all level and easy to walk on. The gravel and dirt trails were similar in that sense, with the exception of a few heavily worn trails which were rocky and uneven. As for wheelchair accessibility, the most accessible trails were the concrete trails at Creeks Preserve. We determined that the LLNF's trails, disregarding the steepness, are relatively accessible. While there are always ways to improve accessibility, the LLNF trails are suitable for most individuals, except those with mobility impairments.

Observing the interpretive materials displayed at the various properties we toured made our team aware of the possibilities the LLNF could utilize at their property. The NCF signs presenting relevant facts and information about what could be seen along the trails were one example that stood out to us. They were more durable than the similar signs at the LLNF. Other valuable interpretive materials we noticed were the multilingual kiosks and the posts with directional arrows and mileage markers. We determined, from both looking at the properties as well as survey results, the current interpretive materials at the LLNF could benefit from an increase in frequency and content, within the foundation's CRs.

The bridge installed at one of the NCF properties sufficiently crossed a bog and merged the trails on either side. This type of installation parallels that of which the LLNF is looking to accomplish. Touring this property has shown us that, logistically, a bridge over wetlands can and has been done at Gardner Farm; therefore, this is a doable implantation for the LLNF.

On average, each property had around three benches spread out alongside the trails. Besides the LLNF, Creeks Preserve was the only other property that offered picnic tables, including one wheelchair accessible table (Figure 34). Based on the survey, the community wants an increase in benches and picnic tables around the LLNF. Furthermore, after seeing the accessible seating at Creeks Preserve, we can conclude that the LLNF is able to make their seating more accessible.

4.3 Recommendations

The Linda Loring Nature Foundation's current master plan is still in the drafting stage where particular aspects are not completely finalized. Thus, we are presenting a set of recommendations which prioritize actions of the master plan that ensure support and interest from the community and identify viewpoints that may have been overlooked. Our recommendations are as follows:

4.3.1 Prioritized Actions

Based upon survey findings and interview responses from stakeholders and the Nantucket community, we have created a recommended priority list involving actions of the current master plan. The priority of these actions are recommended for development purposes as implementing higher priorities first will allow LLNF to theoretically increase user engagement at the property. Certain actions may not feasibly suit the order of priority based on budgeting and timeline constraints but will allow the foundation to understand the interest levels of the community and evaluate their future implementation plan in correlation to their overall goal. We recommend the construction/installation of the following based on priorities indicated.

High priority features include:

- Research & education facility;
- Bridge (property connection);
- New trails;
- Viewing platforms; and, benches & picnic tables.

Intermediate priority features include:

- Pond dock;
- Research/intern housing;
- Outdoor classrooms; and,
- More signage.

Low priority features include:

- Additional parking;
- Eye-level features; and,
- Wildlife blinds.

From the survey results specifically, the highest-prioritized actions were found to be developing new trails, viewing platforms, and installing benches and picnic tables. In relation to the development of new trails, a connection to the newly acquired parcel of land becomes prioritized as well in order to access more space for such trails. Interview responses received from the LLNF Senior Board Member and Matt Liddle have placed a heavy emphasis upon research at the property which brings priority to the construction of a research and education facility. Proceeding priorities were developed from survey results that received lower priority rating by respondents.

4.3.2 Interpretive Material Recommendations

Current interpretive material around the property consists of an informational kiosk board with physical handouts and QR codes, numbered wooden posts along the main trail, and numerous lawn signs with story pages on them. Based upon results of the survey, it is clear that stakeholders and the community would like improved interpretive material, therefore we recommend updating and adding interpretive and informational signage.

Survey respondents indicated a preference for signage in the form of more permanent, physical displays posted in the ground. This signage should consist of easily noticeable trail markers, informational descriptions of flora and fauna along trails, and markers signifying points of interest around the property. We also suggest translating certain signage into Spanish to reach and be more inclusive of a broader audience. Updated signage as such will foster more

interaction for users of the property but will require more maintenance. All signage will need to comply with the LLNF's conservation restrictions.

4.3.3 Staffing Recommendations

Currently, the Linda Loring Nature Foundation uses volunteers, staff members, and professional contractors to maintain the property. The recent acquisition of land from the Loring estate will pose additional maintenance work. **Accordingly, we recommend hiring a full-time land maintenance staff person.**

Hiring a land manager who will take care of all land maintenance will free up time for other staff members to focus on tasks related to research, education, and programming.

4.3.4 Accessibility Recommendations

The property of LLNF is currently in a state where accessibility is limited in numerous ways, as previously identified from our interview findings with Matt Liddle, Mickey Rowland, and Brenda McDonough. Based upon discussions with these stakeholders, we recommend:

- Expanding parking lot entrance or adding an entrance parking loop;
- Creating a handicap parking spot;
- Creating an all accessible trail; and,
- Developing virtual trail tours.

The majority of these recommendations would require permits due to the conservation restrictions placed on the LLNF property. The options would need to be discussed with board members and staff to identify whether potential benefits would align with their overall mission as a foundation. Expanding the parking entrance or creating an entrance loop would allow for easier access to the property, especially by bus, which would be beneficial for collaborations with schools. A designated handicap parking space leading to an all-access specific trail would give the ability to those with disabilities the chance to visit the property. The trail would need to consist of a stone dust surface that does not exceed a 5% slope of elevation for mobility

purposes. The trail could potentially be a short path potentially leading out to a scenic vista overlooking Long Pond. A post and rope system set up along that same all access trail would also be of value for those with sensory impairments. The only recommendation option that requires no modification of the land would be a virtual trail tour. This could be posted on the LLNF website to give those who cannot make it out to the property a chance to still experience the land just from another perspective.

4.3.5 Educational & Research Program Recommendations

The interviews our team conducted with members of the various conservation organizations on Nantucket, including the Linda Loring Nature Foundation, Nantucket Land Council, and Nantucket Land Bank, provided useful new ideas for future programmatic implementation at the LLNF. From our interview with Turcotte at the NLC, we were informed of a plethora of programs and opportunities the LLNF can incorporate with having access to the pond and the wetlands. We recommend the following programs and opportunities:

Educational programs such as:

- Vernal pool tours to learn about the different plant and animal species living within; and,
- Kayak tours on Long Pond to discuss the effects of climate change on the pond and the species that inhabit it.

Research programs/opportunities such as:

- Volunteering opportunities to monitor and collect data in regard to how climate change affects the wildlife on/in the pond;
- Opportunities to monitor the climate change effects on species living in the wetlands;
- Monitoring movement and number of particular species in the pond including Striped Bass, American Eels, Blue Crabs, Atlantic Herring and various types of turtles;
- Measuring the water quality in the pond due to the current lack of data on this matter;

- The installation and monitoring of tide gauges on the pond to track tides, storm surges, sea level rise, and flooding; and,
- Monitoring the invasive species that potentially reside on the new parcel of land.

Survey responses also illustrate community interest in kayak tours and programs involving climate change impacts on the property and Nantucket as a whole. These opportunities and programs will boost community engagement with the property as well as provide ways the LLNF's new parcel of land can be utilized. The research opportunities involving studying the effects of climate change on the various plant and animal species on the property and the pond will provide LLNF with valuable data in regard to the future of their property. The expenses required to implement these programs and research are reasonably low with the few pieces of equipment necessary.

A senior LLNF Board Member also provided us with the idea for new research opportunities directed towards high school students. We recommended the LLNF create a small program that would allow students to conduct research in partnership with the foundation to learn more about ecology, biology, and botany. No other organization on Nantucket does a program similar to this. This would benefit both students in developing a future career path in environmental science as well as the LLNF by creating a unique opportunity to stand out from other conservation organizations on the island. A partnership with the high school on Nantucket might be necessary to accomplish this.

4.3.6 Outreach Recommendations

Based on survey responses and the input given by Hursh, it has become clear that many members of the community are unfamiliar about certain aspects of the LLNF. Some of these areas include property location, programs and activities offered, hours of operation, property configuration, and more. We recommend increasing outreach and visibility in the community.

This should be done by promoting their presence on social media platforms such as Facebook and Instagram, as well as advertising more often through local communication channels. These channels include but are not limited to weekly newsletters, such as the DayBreak Nantucket, Nantucket Current, Nantucket Inquirer and Mirror and local 97.7 radio.

Aside from direct channels as mentioned, there is potential benefit in collaborating with local businesses and schools to distribute flyers with information and dates of upcoming programs and events. We also recommend that the LLNF hosts more larger-scaled events at the property like their Trails and Treats event which holds the potential to introduce more people to the property for the first time. Along with hosting larger events, it would be beneficial for the foundation to run program offerings more frequently as it will provide more opportunities for people with a busy schedule to potentially attend.

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Appendix 1

1.1 Interview Preamble

We are a group of students from Worcester Polytechnic Institute conducting a research project in collaboration with the Linda Loring Nature Foundation to solicit responses from stakeholders and community groups regarding potential improvements to their property for their future Master Plan.

Would you be willing to take some time to answer a few questions in relation to the Linda Loring Nature Foundation? Your participation in this interview is completely voluntary and you may stop at any time. We will be taking notes during our conversation and may wish to quote you in our final report. If so, may we quote you by name, or would you prefer we anonymize your responses? Prior to publication, we will, of course, give you an opportunity to review any quotations. We will also be happy to provide you with a copy of our report when it is completed. We appreciate your participation in this research.

Do you happen to have any questions before we begin? If there are any questions or concerns following the interview, you can contact us at gr-ack21-llnf@wpi.edu or our faculty advisors, Dominic Golding, at golding@wpi.edu and Fred Looft, at fjlooft@wpi.edu.

1.2 Survey Preamble

We are a group of students from Worcester Polytechnic Institute working in collaboration with the Linda Loring Nature Foundation. We ask that you please take this brief 10 minute survey so we can gain insight into your thoughts on the foundation. Your answers will be kept anonymous and will be used to better understand how the Linda Loring Nature Foundation can improve their property and programming for future attendees. Upon completion of this survey, you will have the opportunity to enter into a drawing for the chance to win a free annual, family membership to the Linda Loring Nature Foundation.

Appendix 2

2.1 Objective 1

2.1.1 LLNF Staff Property Interview Script

2.1.1.1 Stewardship Questions

- What land management practices do they use currently and how do the practices differ in different parts of the property?
- Why do they use soil disturbance but not prescribed burning like other conservation groups on the island?
- Who owns the pond and do they get involved in invasive removal on the shoreline?
- Does the access track to the beach present problems for LLNF (e.g., trash, dogs, etc.)?

2.1.1.2 Education Questions

- What educational programs have been established at LLNF?
- What are the main areas of focus for educational programs?
- How does LLNF create programs that appeal to all ages? Are they created to cater to certain age groups over others?

2.1.1.3 Research Questions

- What research programs have been established at LLNF?
- What areas are the main focus of research programs?
- What does LLNF hope to gain from running these research programs?

2.1.1.4 Sign-Off

- Are there any other documents that we can look at?
- Can we get back to you, later on, to clarify anything noted?
- Thank you!

2.1.2 Senior Board Member Interview Script

2.1.2.1 Questions:

1. How long have you been the board president at the LLNF?

2. What is your role as board president of the LLNF?
3. Were there any particular aspects of the LLNF that board members wanted to focus on with the development of the new master plan?
4. Whom did the master planning committee solicit opinions from (board, staff, colleagues, public, others)?
5. How would you, or other board members, differentiate the LLNF from other organizations?
6. How would you view a successful outcome of the master plan?
 - a. How will the predicted outcomes of the master plan affect the current operational function of the foundation?
7. How does the board plan to raise funding for the implementation of the master plan?
8. Have you or do you currently work with any other organizations on Nantucket?

2.1.2.2 Sign-Off:

- Can we get back to you for clarifications if necessary?
- Thank you!

2.1.3 Trails and Treats Feedback Survey

2.1.3.1 Preamble:

- We would like to say thank you to everyone who attended this year's Trails and Treats event. We ask you to please take this brief 5-minute survey so we can hear your feedback. Your answers will be kept anonymous and will be used to better understand how the Linda Loring Nature Foundation can improve this event for future attendees.

2.1.3.2 Questions:

1. Please rate your overall experience of the Trails and Treats event with the Linda Loring Nature Foundation (LLNF).
 - a. 1-not satisfied → 5- Extremely satisfied
2. Was this year's Trails and Treats event your first time visiting the LLNF property?
 - a. Yes
 - b. No
 - c. Other
3. Was this your first time participating in an event with the LLNF?

- a. If you answered "No" to the previous question, please list the other programs you or your family have participated in.
4. How did you find out about the Trails and Treats program this year? Check all that apply.
 - a. LLNF website
 - b. Word of mouth
 - c. Daybreak
 - d. Facebook
 - e. Instagram (social media)
 - f. Radio ad
 - g. LLNF newsletter
 - h. Nantucket Current
 - i. Local events calendar
 - j. Other
5. Please check all the activities your child(ren) participated in:
 - a. Pumpkin Path
 - b. Pumpkin Rot
 - c. Make your own Cheerio Bird Feeder
 - d. Meet a Skeleton
 - e. Can You Put the Photos in Order
 - f. Decomposer Collage
 - g. Guess The Number of Pine Cones
 - h. Photo Booth with the Snowy Egret
6. Please rate the level of enjoyment for each of these activities.
 - a. Pumpkin Path
 - b. Pumpkin Rot
 - c. Make your own Cheerio Bird Feeder
 - d. Meet a Skeleton
 - e. Can You Put the Photos in Order
 - f. Decomposer Collage
 - g. Guess The Number of Pine Cones
 - h. Photo Booth with the Snowy Egret
7. Please rate the educational value of each of these activities.
 - a. Pumpkin Path
 - b. Pumpkin Rot
 - c. Make your own Cheerio Bird Feeder
 - d. Meet a Skeleton
 - e. Can You Put the Photos in Order
 - f. Decomposer Collage
 - g. Guess The Number of Pine Cones
 - h. Photo Booth with the Snowy Egret

8. Did you find these activities to be age appropriate?
 - a. Yes
 - b. No
 - c. Other
9. How likely are you to participate in another Trails and Treats event?
 - a. 1- very unlikely → 5-very likely
10. How likely are you to recommend the Trails and Treats event to friends and family?
 - a. 1- very unlikely → 5-very likely
11. If you were to refer this event to friends and/or family, what age groups would you recommend it for?
 - a. Comment box
12. How many adults attended this event with you (including yourself)?
 - a. Drop down
13. How many children in your care attended this event?
 - a. Drop down
14. How old are each of the children you brought to this event?
 - a. Comment box
15. Please rate your experience using the arrival time/time slots registration system.
 - a. 1-difficult → 5- great, no issues
16. Please rate your experience with parking at the LLNF.
 - a. 1-difficult → 5-great, no issues
17. Did you experience any barriers to attending this event?
 - a. Yes
 - b. No
 - c. If “Yes”, please elaborate.
18. Would handouts/signs translated into different languages have been helpful at this event?
 - a. If yes, then please select which would be helpful.
19. How do you describe your time on Nantucket?
 - a. Full-time, year-round
 - b. Full-time summer resident
 - c. Visitor for more than two weeks
 - d. Visitor for two weeks or less
20. We value your opinions and would greatly appreciate any other feedback you have in regards to your experience at Trails and Treats.
 - a. Comment Box

2.2 Objective 2

2.2.1 General Survey

2.2.1.1 Main Questions:

1. Are you familiar with the Linda Loring Nature Foundation (LLNF)?
 - a. I have never heard of the LLNF
 - b. I have heard of the LLNF but have never visited the property
 - c. I have visited the LLNF property only once
 - d. I have visited the LLNF property more than once
 - e. Other
2. How often do you visit the LLNF property? (Pop up for D/E from question 1)
 - a. Daily
 - b. Weekly
 - c. Monthly
 - d. Every Few Months
 - e. Annually
 - f. Other
3. If you have never been or rarely visit the property, please indicate why? (Pop-up question if answered A/B/C on question 1, select all that apply)
 - a. Transportation
 - b. Location of the Property
 - c. Parking
 - d. Unfamiliar with the Organization
 - e. Lack of Interest
 - f. Property Restrictions
 - g. Haven't Had Time, But Will Visit Soon
 - h. Other
 - i. 3.1 If you have anything else you would like to say about having never been or seldom visiting the property, please elaborate in the comment box below.
4. How do you utilize the LLNF property when you are there? Select all that apply. (Pop-up question if answered C/D/E on question 1)
 - a. Walking the Trails
 - b. Story Walk
 - c. Bird Watching
 - d. Educational Programs
 - e. Research Programs
 - f. Other

5. Have you visited other properties on Nantucket owned by similar organizations? Select all organizations you have visited:
 - a. Nantucket Land Bank
 - b. 'Sconset Trust
 - c. Nantucket Conservation Foundation
 - d. Mass Audubon
 - e. Trustees of Reservations
 - f. Town of Nantucket
 - g. Not Applicable
 - h. Other
6. Out of these organizations, please indicate the three you associate the most with education?
 - a. Linda Loring Nature Foundation
 - b. Nantucket Land Bank
 - c. Nantucket Land Council
 - d. Nantucket Conservation Foundation
 - e. Maria Mitchell Association
 - f. 'Sconset Trust
 - g. Mass Audubon
 - h. Trustees of Reservations
 - i. Town of Nantucket
 - j. Not Applicable
 - k. Other
7. Out of these organizations, please indicate the three you associate the most with research?
 - a. Linda Loring Nature Foundation
 - b. Nantucket Land Bank
 - c. Nantucket Land Council
 - d. Nantucket Conservation Foundation
 - e. Maria Mitchell Association
 - f. 'Sconset Trust
 - g. Mass Audubon
 - h. Trustees of Reservations
 - i. Town of Nantucket
 - j. Not Applicable
 - k. Other
8. Out of these organizations, please indicate the three you associate the most with land management?
 - a. Linda Loring Nature Foundation
 - b. Nantucket Land Bank
 - c. Nantucket Land Council

- d. Nantucket Conservation Foundation
 - e. Maria Mitchell Association
 - f. 'Sconset Trust
 - g. Mass Audubon
 - h. Trustees of Reservations
 - i. Town of Nantucket
 - j. Not Applicable
 - k. Other
9. Which properties have your favorite nature trails on Nantucket?
- a. Comment Box
10. Which of the following LLNF programs/activities have you or your family attended?
Please check all that apply.
- a. Birding Field Trips
 - b. School Field Trips
 - c. Citizen Science
 - d. Biodiversity Walks
 - e. Story Walks
 - f. Long Pond Kayak Tour
 - g. Nantucket Walkabout
 - h. After School Programs
 - i. NAN-Puppets
 - j. Kids in Nature Adventure Packets
 - k. Children's Summer Classes
 - l. Science Pub
 - m. Trivia Night
 - n. In Class Workshops
 - o. Adult Workshops
 - p. Coastal Ecology Class
 - q. BioBlitz
 - r. Trails and Treats
 - s. Independent Research
 - t. Volunteer Opportunities
 - u. None
11. Which of the following LLNF programs/activities would you or your family be interested in attending in the future? Please check all that apply.
- a. Birding Field Trips
 - b. School Field Trips
 - c. Citizen Science
 - d. Biodiversity Walks
 - e. Story Walks

- f. Long Pond Kayak Tour
 - g. Nantucket Walkabout
 - h. After School Programs
 - i. NAN-Puppets
 - j. Kids in Nature Adventure Packets
 - k. Children's Summer Classes
 - l. Science Pub
 - m. Trivia Night
 - n. In Class Workshops
 - o. Adult Workshops
 - p. Coastal Ecology Class
 - q. BioBlitz
 - r. Trails and Treats
 - s. Independent Research
 - t. Volunteer Opportunities
 - u. None
12. Please offer any additional comments you may have on the LLNF's current or future programs in the box below.
- a. Comment box
13. How do you rate the trails at the LLNF property? (Pop up for people who answer A on question 4, scale of 1 to 5)
- a. 1 → poor and 5 → exceptional ... N/A
 - b. Other
 - i. 12.1 → If you have any further comments in relation to your rating of the trails at the LLNF property, please leave them in the comment box below.
14. How would you rate the current interpretive materials (signs, kiosk, brochures, etc.) around the property? (Pop up for people who've been to the property, scale 1 to 5)
- a. 1 → poor and 5 → exceptional N/A
 - b. Other
 - i. 13.1 If you have any further comments in relation to your rating of the interpretive materials on the LLNF property, please leave them in the comment box below.
15. How would you rate the accessibility of trails at LLNF? (Pop up for people who've been to the property, scale 1 to 5)
- a. Slider scale: 1-Highly restrictive 5-No restriction
16. If you have any comments or suggestions based on improving the accessibility of the LLNF property, please provide them here in the comment box below. (Pop up for those who've been to the property)
- a. Comment box

17. How important to you are the following potential additions to the LLNF property? Please select all that apply. ****Make all of these a sliding bar w/ N/A option****
- New trails
 - More signage
 - Viewing platforms
 - Wildlife blinds
 - Dock on North Head Long Pond
 - Benches and picnic tables
 - Additional parking
 - Outdoor classrooms
 - New Education and Research Facility
18. How important are each of these trail features to you? (Pop up for people who answer A on question 4 or A on question 16) ****Make all of these a sliding bar, 1 to 5 scale****
- Access to Points of Interest
 - Access to Scenic Vistas
 - Access to Wetland Views
 - Points of Quiet Solitude in Nature
 - Shaded Areas
 - Sunny Areas
 - Other
19. If interpretive materials around the property were updated, how important would each of the following be to you? ****Make all of these a sliding bar w/ N/A option****
- Trail markers
 - Informational descriptions of the flora and fauna along the trails
 - Markers for viewing spots/points of interest around the property
 - Directions for parking
 - Property signs at entrances
 - Road signs near property
 - Other
20. For interpretive materials, which methods of delivery would you prefer? ****Make all of these a sliding bar w/ N/A option****
- Physical Signage
 - Paper Handout
 - QR Code
 - Downloadable App
 - Web App/Website
 - Other
21. If the LLNF built a dock on North Head Long Pond, please indicate which activities you would like prioritized. ****Make all of these a sliding bar w/ N/A option****
- Observing the Pond and the Flora and Fauna Living In and Around the Water

- b. Participating in Research Programs Hosted by LLNF
 - c. Participating in Education Programs Hosted by LLNF
 - d. Other
22. Would you be interested in gap year, summer term, or academic break programs with the LLNF?
- a. Yes
 - b. Maybe
 - c. No
 - d. Other
23. Would you be interested in the mentoring and research opportunities provided by LLNF?
- a. Yes
 - b. Maybe
 - c. No
 - d. Other
24. Do you wish there were more research and education opportunities offered to people of your age specifically?
- a. Yes
 - b. Maybe
 - c. No
 - d. Other
25. Would you be interested in academic style classes offered by the LLNF?
- a. Yes
 - b. Maybe
 - c. No
 - d. Other
26. Are there steps that the LLNF could take to be more welcoming for you at our property?
- a. Comment box
27. Are there steps that the LLNF could take to be more welcoming for you in our programming?
- a. Comment box
28. How could the LLNF's outreach and communication be more inclusive?
- a. Comment box

2.2.1.2 Transition Question:

29. How would you identify yourself in relation to the LLNF? Please select all that apply.
- a. Member of the General Public (Not Already Part of LLNF Audience)
 - b. Recreational User
 - c. Educator (Teacher, Counselor, Etc...)
 - d. Adult Educational Users (Already Part of LLNF Audience)

- e. Student (High School or College Student or Secondary and Postsecondary Student)
- f. Parent/Guardian/Caregiver
- g. Research Collaborator
- h. Neighbor
- i. Climate Change Collaborator
- j. Past Intern/Volunteer
- k. Other → Done After This Question

2.2.1.3 Stakeholder Groups with Specific Questions:

1. Recreational Users

N/A

2. General Public

N/A

3. Desired Future Educational Users (Adult Educational Users)

N/A

4. Neighbors

1. As a neighbor, how do you feel about the LLNF?
 - a. Comment box
2. Do you live in any of these neighborhoods?
 - a. Fisher's Landing
 - b. Eel Point Road
 - c. Trotts Hills
 - d. Long Pond
 - e. Other

5. PreK-12 Educational Users

1. What future educational elements would you like to see implemented at the LLNF's property? (Final question for every educational user)
 - a. Comment box

Parent/Guardian/Caregiver:

1. Has your child(ren) been to the LLNF in the past?
 - a. Yes
 - b. I am unsure
 - c. No
 - d. Other
2. What grade is your child(ren) in? Select all that apply.
 - a. Pre-K → 2nd
 - b. 3rd → 5th
 - c. 6th → 8th
 - d. 9th → 12th
 - e. College/University
 - f. Other
3. Which type of school does your child(ren) attend? Select all that apply.
 - a. Public
 - b. Independent/Private
 - c. Other
4. Has your child(ren) participated in any LLNF property visits or activities as a part of a school-coordinated field trip/program?
 - a. Yes
 - b. I am unsure
 - c. No
 - d. Other
5. What LLNF programs or activities did your child(ren) participate in? (pop up if answered “yes” for question 4)
 - a. After-school programs
 - b. Summer programs
 - c. Field trips at the property
 - d. Field trips elsewhere
 - e. In class workshops
 - f. Independent research with a LLNF mentor
 - g. Other
6. Please list what summer programs your child(ren) have participated in. (Pop up if answered summer programs to the previous question)
 - a. Comment Box
7. Please rate your child(ren)’s overall experience participating in programs and activities at LLNF. (pop up if “yes” was answered for question 5)
 - a. Positive, neutral, negative, unsure
8. How likely are you or your family to participate in LLNF programs in the future?
 - a. Scale 1-5

Students:

1. What grade are you in?
 - a. 9th → 12th
 - b. University
 - c. Other
2. Which type of school do you currently attend?
 - a. Public
 - b. Independent/Private
 - c. Other

Teachers:

1. Have you collaborated with LLNF for a program in the past?
 - a. Yes
 - b. No
 - c. Not sure
2. Would you be interested in future collaboration? (pop up if answered “no” or “Not sure” to question 1)
 - a. Yes
 - b. No
 - c. Not sure
3. Would you consider collaborating with the LLNF for school field trips again in the future? (pop up if answered “yes” to question 1)
 - a. Yes
 - b. Maybe
 - c. No
 - d. If “No”, please explain why
4. What LLNF programs have your students previously participated in? (pop up if answered “yes” to question 1)
 - a. Independent research with a LLNF mentor
 - b. Volunteer Opportunities
 - c. After-school programs
 - d. Field trips at the property
 - e. Field trips elsewhere
 - f. In class workshops
 - g. Other
5. On a scale of 1 to 5, how valuable were the LLNF programs to your students' learning experience? (pop up if answered “yes” to question 1)
 - a. 1- Not valuable → 5- Very valuable
6. What would you look for with additional program offerings with the LLNF?

- a. Comment box
- 7. What perceived barriers inhibit your collaboration with the LLNF?
 - a. Comment box
- 8. What type of school do you work for?
 - a. Public
 - b. Independent/Private
 - c. Other

6. Research Collaborators/Climate Change Collaborators

- 1. What research collaborations have you been involved in with the LLNF?
 - a. Comment box
- 2. What type of research would you be interested in doing at the LLNF property?
 - a. Comment box
- 3. How could the LLNF assist you in accomplishing your research goals?
 - a. Comment box
- 4. What perceived barriers, if any, exist to you doing research with the LLNF?
 - a. Comment box

7. Accessibility Collaborators/Equity and Inclusion Stakeholders

N/A

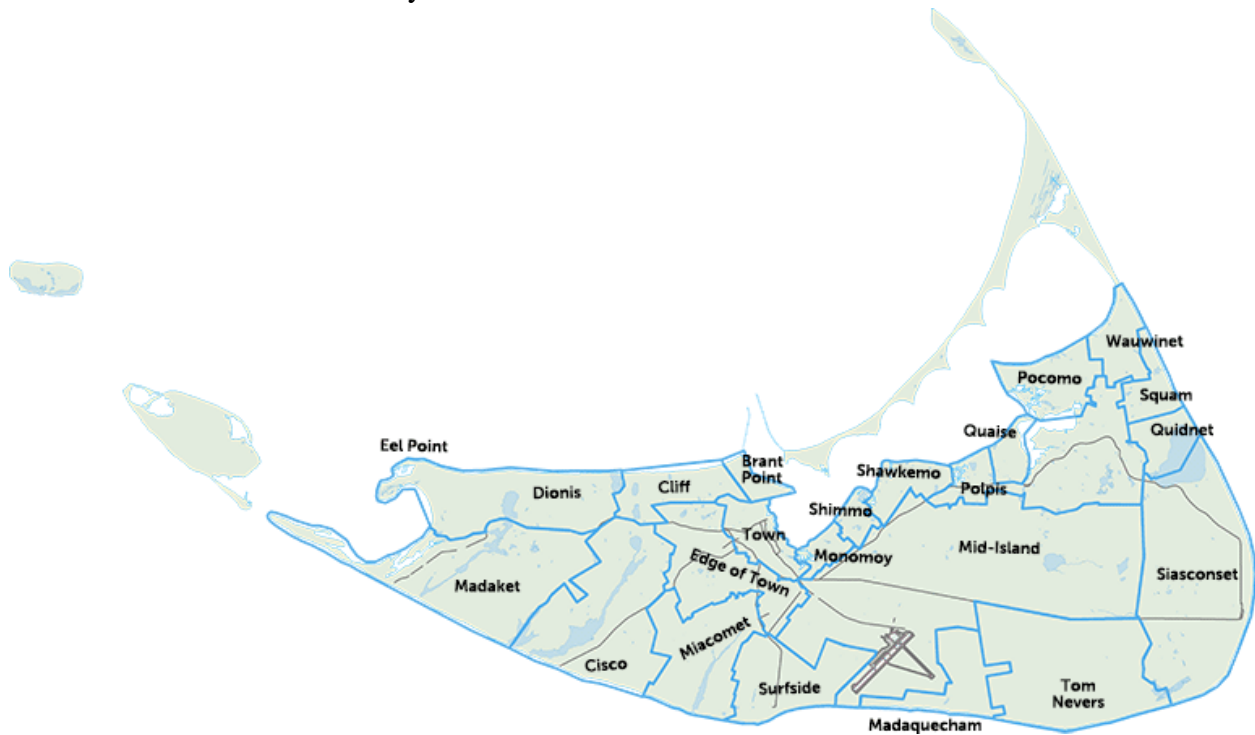
8. Past Interns and Volunteers

- 1. Please rate your experience interning/volunteering with the LLNF.
 - a. 1- Poor → 5 - Very good
- 2. What perceived barriers, if any, existed to you when interning or volunteering with the LLNF?
 - a. Comment Box
- 3. What additional facilities would enhance the experience for future interns/volunteers?
 - a. Comment box
- 4. Are there other changes that would have enhanced your overall experience with the LLNF?
 - a. Comment Box
- 5. Is there any information that would have been helpful to have prior to starting your internship or volunteer experience at the LLNF?
 - a. Comment box
- 6. Was your internship and/or volunteer experience with the LLNF valuable to your future academic and career endeavours?
 - a. Comment Box

2.2.1.4 Demographic Questions:

1. How would you describe yourself?
 - a. American Indian or Alaska Native
 - b. Asian
 - c. Black or African American.
 - d. Native Hawaiian or Other Pacific Islander
 - e. White
 - f. Prefer Not to Say
2. What is your age?
 - a. 14 - 18
 - b. 19 - 25
 - c. 26 - 40
 - d. 41 - 64
 - e. Over 65
 - f. Prefer Not to Say
3. How do you describe your time on Nantucket?
 - a. Full-time, year-round
 - b. Full-time summer resident
 - c. Visitor for more than two weeks
 - d. Visitor for two weeks or less
 - e. Other
 - f. Prefer Not to Say
4. What area of Nantucket are you from? (Pop up after previous question only for people who live on Nantucket)
 - a. Wauwinet
 - b. Squam
 - c. Quidnet
 - d. Siasconset
 - e. Pocomo
 - f. Quaise
 - g. Polpis
 - h. Mid-island
 - i. Tom Nevers
 - j. Shawkemo
 - k. Shimme
 - l. Monomoy
 - m. Brant Point
 - n. Madaquecham
 - o. Town/Edge of Town

- p. Miacomet
- q. Surfside
- r. Cliff
- s. Cisco
- t. Dionis
- u. Madaket
- v. Eel Point
- w. Prefer Not to Say



Source: <https://compassroserealestate.com/about-nantucket/nantucket-tour/>

* Note that certain surveys will likely be translated into Spanish and Portuguese and possibly other languages.

2.2.2 Mickey Rowland and Brenda McDonough Interview Script

2.2.2.1 Questions:

1. Are there any particular conservation properties around Nantucket that come to mind for having exceptional accessibility features?
2. How does accessibility blend with the historical elements of Nantucket?
3. How does accessibility blend with conservation elements of Nantucket?

4. Do you have any thoughts for the island on how spaces can be made more accessible?
5. What are the biggest challenges with accessibility in open spaces?
6. What can open spaces do to better promote accessibility?
7. How can we blend accessibility with open space protection?
8. How can expert users be reached to better understand the scope of accessibility?

2.2.2.2 Sign-Off:

- Can we get back to you for clarifications if necessary?
- Thank you!

2.2.3 Isaac Hersh Interview Script

2.2.3.1 Questions:

1. How long was your internship with the LLNF?
2. What were some of the daily tasks that you completed here at the LLNF as an intern?
3. Were there any bigger projects taking place at the LLNF that you wished you had been a part of during your time there?
4. Do you have any recommendations for improving the internship program at the LLNF?
5. How would on-site intern housing have changed your time with the LLNF?
6. What advice might you give to future interns at the LLNF?
7. In hindsight, is there anything that would have enhanced your experience with the LLNF?
 - a. How could you have been better supported?
8. What were your biggest takeaways?
 - a. Are you using any of the skills that you acquired in your internship, in your career today?
9. How do you believe the LLNF separates itself from other organizations on Nantucket?
10. Was the internship as advertised?
11. In your opinion, what is the LLNF's perceived role in the community compared to other organizations?

2.2.3.2 Sign-Off:

- Can we get back to you for clarifications if necessary?
- Thank you!

2.2.4 Matt Liddle Interview Script

2.2.4.1 Questions:

1. As an educator and member of the strategic planning committee, what aspects of the strategic plan did you find valuable to promoting educational opportunities at the LLNF?
2. Have you brought students to the LLNF in the past?
3. If so, what LLNF programs or activities did you and your students participate in?
4. How was your overall experience? Did you find the programs beneficial to the students?
5. In what areas do you think the LLNF can improve their educational programs to better collaborate with local schools?
6. Do you believe there are any perceived barriers to collaborating with the LLNF?
7. Are there any physical property improvements you would like to see at the LLNF to perhaps better the experience of visiting?
8. As a former LLNF board member, what about this organization is unique in comparison to the other organizations on Nantucket?

2.2.4.2 Sign-Off:

- Can we get back to you for clarifications if necessary?
- Thank you!

2.3 Objective 3

2.3.1 RJ Turcotte Interview Script:

2.3.1.1 Questions:

- What are the kinds of things you do for the Land Council?
 - In what ways do you collaborate with the LLNF?
- How much have you heard about LLNF's new parcel of land and their new Master Plan?

- For LLNF’s new property, what kinds of educational programs could they do with wetlands and the new access they have to the pond?
 - Similarly, what kinds of research programs could they potentially do with this new property?
 - Are you aware of how the property’s Conservation Restrictions might play into this? What are their specific implementations they will and won’t be able to make?
- Does the Land Council offer any internship programs?
 - Is the Land Council able to provide housing for researchers and interns?
- Where does the Land Council hold its programs?
- Does the Land Council utilize a specific strategic plan?
- What kinds of facilities, if any, does the Land Council own and operate?

2.3.1.2 Sign-Off:

- Can we get back to you for clarifications if necessary?
- Thank you!

2.3.2 Rachel Freeman Interview Script:

2.3.2.1 Questions:

1. How long have you been working at the Land Bank?
2. What are some of the practices used to maintain the different properties at the Land Bank?
 - a. With the many different plots of land owned by the Land Bank, do certain ones receive more attention than others when it comes to maintenance?
3. What is the typical process for creating a new trail on a property?
4. What is the typical process for creating new signage around a property?
5. How are the different properties utilized for educational and research programs?
6. Does the Land Bank have any approaches to developing programs?
 - a. Are there specific user groups that the Land Bank tries to target?
7. What sets the Land Bank apart from other organizations on the island?
8. With the many different plots of land owned by the Land Bank, would you say that each of them have the same feel or bring something unique to the table?

9. Does the NLB have a strategic plan and if so, how is it implemented with the various owned properties?

2.3.2.2 Sign off:

- Can we get back to you for clarifications if necessary?
- Thank you!

Appendix 3

Methodology

3.1 Objective (1): Assess how the LLNF currently implements its strategic goals of stewardship, education, and research through its various programs and activities.

We explored the LLNF property in person and informally interviewed staff to learn in more detail how they implement their strategic goals of stewardship, education, and research. We wanted to know for:

- Stewardship, what practices have been set in place to maintain the property in relation to accessibility around the property and ecological wellbeing?
- Education, how is the property incorporated into educational programs that focus on specific audiences?
- Research, what are the benefits of having research programs take place directly on the property?

It was important for us to understand how the LLNF staff envision and utilize their property from the perspective of its strategic goals. The LLNF property contains wetlands, grasslands, shrubs, and more that spread over the 275-acre plot. Programs developed alongside the LLNF strategic plan take place in specific locations around the property that are deemed appropriate for the targeted audiences and program objectives. Looking more in-depth at the LLNF programs, we wanted to determine why and how specific pieces of land are designated to each program. To achieve this, we walked the LLNF property both on our own and on a guided tour with members of the LLNF staff. During the guided tour on October 22, 2021, we asked the LLNF staff to identify where programs take place on the property as well as the reasoning behind choosing to use the specific piece of land for either educational programming or research collaborations. We additionally hoped to learn more about the ecology and management practices of the property while exploring the land, including the large parcel of land that was recently added to the property but is not yet used for programming purposes. We took a separate tour of the LLNF property on November 1, 2021.

The guided tours served as an informal interview with the staff members. While walking on the property during the interview with the LLNF staff, we asked questions that we had prepared ahead of time as listed in Appendix 2 Section 2.1.1 to 2.1.4. This process allowed us to become more familiar with the land and develop a list of notes to reference when we were developing a survey to solicit public opinion on ideas presented in the draft master plan and create recommendations later on.

Apart from interviewing the staff and exploring the property, we also observed the annual Trails and Treats event at the LLNF on October 29, 2021 to get a better understanding of how programs are run and learn how the staff interacts with the public. While the event was taking place, we took into account how visitors accessed specific areas of the property: Is the designated location accessible by a trail, and are there any potential barriers to accessibility for all individuals? Here we identified areas of higher use, specifically with younger children, that required maintenance prior to the event as preparation and monitoring by staff and volunteers during the event. This process of observing a live program began with one of the LLNF staff members introducing us to the groups of children and adults participating in the activities and explaining that we were there to observe the program for the purpose of research. Since the Trails and Treats program involved young children, it was clearly stated that no photos would be taken of the participants and no questions were asked to children by anyone in our student group. Additionally, an LLNF staff member was present at all times throughout the program to accompany the children through the activities so that we were not alone with them at any given time. Observations from the event were noted and used in review later on while a feedback survey was developed in Qualtrics for the event (Appendix 2 Section 2.1.5). We pretested this survey by sending it to our sponsors, advisors, and the other students in our IQP cohort to obtain their feedback.

We interviewed a Senior Board Member from the LLNF on November 22, 2021 to get a better understanding of how he sees the master plan and future improvements at the foundation from the perspective of the Board. To conduct this interview, we first presented our interview preamble, available in Appendix 1 Section 1.1, and gained consent to record the conversation via audio recording. We conducted this interview in person at the LLNF offices following our weekly meeting with both our sponsors and advisors. During the interview, Desmond led the conversation while Delaney, Iris, and Jane kept notes and provided supplemental questions as

needed. The interview script can be found in Appendix 2 Section 2.2.2 and the information collected can be found in (add in reference to results section later).

3.2 Objective (2): Solicit stakeholder opinions in relation to the purpose, content, and future implementation of the LLNF draft master plan.

Our team designed and implemented a survey for the LLNF stakeholders to determine which aspects of the LLNF’s draft master plan should be prioritized and executed. The table below illustrates how the different stakeholder groups are defined.

Table 5. The LLNF Stakeholder Groups Defined

<u>LLNF Stakeholders</u>	<u>Definitions</u>
General Public	- Individuals who are both year-round and seasonal residents of the island - Classified as anyone who could have potentially interacted with the LLNF organization or their property
Recreational Users	- Individuals who have interacted with the LLNF property recreationally, whether it be walking the trails, geocaching, birding, etc
Desired Future Educational Users	- High school upperclassmen, college-age students, and adults who could potentially interested in educational lectures, research collaboration as well as gap year, academic break, or summer term programs with the LLNF
PreK-12 Educational Users	- Parents of the students who have attended programs at LLNF - Teachers who have or might collaborate with the LLNF for educational use - Students who have participated in the programs
Research Collaborators	- Groups the LLNF have worked with in the past to conduct research on and off-island
Neighbors	- Individuals who live on Fisher’s Landing, Eel Point Road, Trotts Hills, and Long Pond
Past Interns / Volunteers	- Individuals the LLNF had hired in the past to assist them with operations at the property
Accessibility Collaborators/Equity and Inclusion Stakeholders	- Individuals who work at organizations on island specializing in areas of accessibility and inclusion, such as the Town of Nantucket Diversity, Equity, and Inclusion Office and the Town of Nantucket Commission on Disability

These particular user groups were helpful in determining what general improvements and developments the LLNF should prioritize while including the new land addition, along with understanding what programmatic implementations respondents valued the most. Furthermore, a key member of the Accessibility Collaborators group, (add in name after interview is set up), offered some insight on the physical process of how the LLNF could implement some of the accessibility improvements outlined in the survey results.

The methods in which we gained input varied depending on the groups themselves. Generally, we surveyed all of the stakeholder groups, and only interviewed key members of certain groups as discussed later in this objective. We created a general survey pertaining to the new master plan that included questions to be answered by every stakeholder group previously mentioned. The main part of this survey was comprised of eight parts:

- Familiarity with the LLNF property and what they do as an organization
- Familiarity with other environmental and conservation organizations on Nantucket
- Familiarity with the LLNF's programmatic aspects (research and education)
- Quality of the LLNF's property (trails, interpretive materials, accessibility, etc.)
- Potential interest in new additions to the LLNF property (trails, interpretive materials, dock, viewing platforms, etc.)
- Potential interest in new programs offered by the LLNF
- General improvement of inclusivity

Every respondent of this survey saw these sets of questions along with a transition question at the end of the general section that would determine which, if any, break-off questions the respondent would then encounter depending on how the respondents self-identified themselves in relation to the LLNF. People who identified as Adult Educational Users, Neighbors, Parents/Guardians/Caregivers, Students, Educators, Research Collaborators, or Past Interns/Volunteers would receive additional break-off questions specific to their categories. These questions can be seen in Appendix 2 Section 2.2.1 under the Stakeholder Groups section. After the break-off questions, the respondents would then receive demographic questions to help gauge the age and ethnic and residential status of the respondent on Nantucket. We used the survey preamble, available in Appendix 1 Section 1.2, to explain the nature of the survey and to solicit participant consent. This survey was distributed by email from our sponsors to the different organizations and groups shown in Appendix 3 Section 3.1, and it contained questions

seen in Appendix 2 Section 2.2.1. We pretested this survey in the same manner as described in Objective 1 to ensure there were no difficulties or errors overlooked before the survey was officially distributed. The responses we got from the stakeholders were then used to determine how individuals feel about the LLNF, as well as potential areas of growth for the foundation.

As for the interview aspect of this objective, we spoke to three individuals in regards to their connections with the LLNF. We interviewed Mickey Rowland, who is a chairman for the Nantucket Commission on Disability, Isaac Hersh, a former LLNF intern, and Matt Liddle, an educator at the Nantucket New School as well as a former LLNF board member who was part of the strategic planning committee. The interview script for Rowland can be found in Appendix 2 Section 2.2.3, consisting of questions involving accessibility at the LLNF property. We asked Hersh about his time as an intern at the LLNF and his overall experience with the organization, as seen in Appendix 2 Section 2.2.4. Because we previously spoke to an LLNF board member in Objective 1, we focused on Liddle's experience as an educator and a member of the strategic planning committee. We gained insight on his view of LLNF's educational programs and how they fit into the proposed master plan using the question from Appendix 2 Section 2.2.5. We gained consent for each interview using the preamble referenced in Appendix 1 Section 1.1.

3.2.1 Methods for Survey Dispersal

Stakeholders	Outreach Method Examples
General Public / Recreational Users / Desired Future Educational Users	<ul style="list-style-type: none"> - LLNF Newsletter - Ad on LLNF website - LLNF Social Media (Facebook, Instagram, etc.) - DayBreak Nantucket ad - Nantucket Current - The Nantucket Inquirer and Mirror ad - Nantucket Island Chamber of Commerce - Nantucket Radio ad
PreK-12 Educational Users	<ul style="list-style-type: none"> - Superintendent of Public Schools - Nantucket Lighthouse School - Nantucket New School - Nantucket Community School - Montessori Children's House of Nantucket - Small Friends on Nantucket - Nantucket Boys and Girls Club
Research Collaborators	<ul style="list-style-type: none"> - Sandplain Grassland Collaborators - Advisory Board - Past/current LLNF Collaborators
Neighbors	<ul style="list-style-type: none"> - Fisher's Landing Homeowners Association - Neighbor Email List in Possession of Kitty Pochman - Email List of Board Members
Past Interns / Volunteers	<ul style="list-style-type: none"> - Past LLNF Interns / Volunteers
Accessibility Collaborators / Equity and Inclusion Stakeholders	<ul style="list-style-type: none"> - Nantucket STAR - Nantucket Family Resource Center - Fairwinds Counseling Center - Nantucket Commission on Disability - Nantucket Behavioral Health Advisory - Nantucket Mental Health Coalition - ACK Teens - Nantucket Diversity, Equity and Inclusion Office

3.3 Objective (3): Identify how different organizations operate in their role of environmental conservation and preservation in Nantucket.

Based on the initial background research, we identified three organizations for further assessment, including the Nantucket Land Council (NLC), the Nantucket Land Bank (NLB), and the Nantucket Conservation Foundation (NCF). To begin this objective we continued our background research to gain a better understanding of their properties and programs. We consulted with our sponsor to identify recommendations for people to interview and topics to be addressed.

In order to know which properties would be of the greatest value to our project we consulted with our sponsor to hear which properties were most similar ecologically or similar in uses. As a team, we used this information to formulate a list of eight properties that fit the proper criteria. We visited these key sites by conducting self-guided tours. During these visits and subsequent interviews, we focused on the following questions:

- What are the characteristics of the property (i.e., habitats, trails, structures, biodiversity)?
- How is the property being used (i.e., research, programs, other activities)?
- How is the property managed (i.e., invasive removal, mowing, burning)?
- What collaboration is there between this organization and the LLNF now or theoretically in the future?

We conducted a few interviews at locations chosen by the interviewee. For RJ Turcotte, the Resource Ecologist for the NLC, the interview took place at the Land Council's main building and followed the script in Appendix 2, Section 2.3.2. The interviews were conducted primarily in person with some online later on. Before the interview, we contacted each interviewee by email to verify what format they preferred to give their consent in. At each interview we began with our preamble to explain the nature of the research and to solicit participant consent, this can be found in Appendix 1 Section 1.0. Once the format and location of the interview were arranged, we again followed the interview protocol as outlined in Objective 1. During the interviews, we asked similar variations of the questions outlined in Appendix 2, Section 2.3.1 script. Once the interview for an organization was completed, we compiled all the notes and used that information when compiling the comparisons between the LLNF and other nature conservation and preservation organizations on Nantucket, as well as our

recommendations. During the same time, we were scheduling and conducting interviews while we visited properties owned by either the NCF, NLB, or Mass Audubon. During these self-guided tours, we compiled data about each property to more easily compare it to the LLNF property. The information gathered from this process was summarized in Table 5 of the Findings section 4.1.3.