

# MASS AUDUBON'S ALL PERSONS TRAILS



**A Manual of Guidelines and Best Practices  
For Developing and Operating  
Universally Designed Interpreted Trail Experiences**

**Mass Audubon's All Persons Trails**  
A Manual of Guidelines and Best Practices  
For Developing and Operating  
Universally Designed Interpreted Trail Experiences

*Copyright 2016 Mass Audubon*

Lucy Gertz, Mass Audubon Statewide Education Projects Manager  
Stu Weinreb, Mass Audubon Director of Capital Assets and Planning  
Kris Scopinich, Mass Audubon Director of Education  
Gary Clayton, Mass Audubon President  
Jerry Berrier, Perkins School for the Blind Access Technology Consultant  
Kim Charlson, Perkins School for the Blind Library Director  
Marcy Marchello, Massachusetts Department of Conservation and Recreation Universal Access Program Coordinator  
Gigi Ranno, Massachusetts Department of Conservation and Recreation Universal Access Outreach Coordinator

Mass Audubon protects 36,500 acres of land throughout Massachusetts, saving birds and other wildlife, and making nature accessible to all. As Massachusetts' largest nature conservation nonprofit, we welcome more than a half million visitors a year to our wildlife sanctuaries and 20 nature centers. From inspiring hilltop views to breathtaking coastal landscapes, serene woods, and working farms, we believe in protecting our state's natural treasures for wildlife and for all people—a vision shared in 1896 by our founders, two extraordinary Boston women. Today, Mass Audubon is a nationally recognized environmental education leader, offering thousands of camp, school, and adult programs that get over 225,000 kids and adults outdoors every year. With more than 125,000 members and supporters, we advocate on Beacon Hill and beyond, and conduct conservation research to preserve the natural heritage of our beautiful state for today's and future generations. We welcome you to explore a nearby sanctuary, find inspiration, and get involved. Learn how at [massaudubon.org](http://massaudubon.org).



***Connect with us***



**[massaudubon.org](http://massaudubon.org)**

208 South Great Road, Lincoln, MA 01773



This project was made possible in part by the Institute of Museum and Library Services  
(IMLS grant # MA-II-0012.)

# CONTENTS

1	<b>Introduction</b> - Accessibility and Inclusion at Mass Audubon
2	Mass Audubon's All Persons Trails - An overview
4	<b>Guidelines for Planning, Designing, and Constructing Accessible Trails</b>
5	Planning a Rewarding Nature Experience for All
5	Accessibility Regulations and Accessible Trail Standards
6	Massachusetts' Accessible Trails
7	Trail Planning and Site Selection
8	Trail Design Elements
13	Regulatory Considerations
13	Permitting
14	Structures
15	Construction
16	Other Power-Driven Mobility Devices (OPDMD)
17	Summary
18	<b>An Inclusive Approach to Developing All Persons Trails</b>
19	Collaborating with Partners
21	Expert Users and Testers
22	Summary
23	<b>Guidelines for Creating Trail Experiences and Trail Materials</b>
25	Navigational Resources
25	Signage
28	Audio Tours
31	Online Resources and Organizational Information
31	Summary
32	<b>Guidelines for Operating All Persons Trails</b>
33	Maintenance/Upkeep of Trail and Trail Materials
33	Accessibility and Inclusivity Training and Customer Service
35	Outreach
37	Measuring Impact Assessing Effectiveness, Ongoing Refinements
38	Summary
39	<b>Reflections on Becoming a More Inclusive Organization</b>
40	Realities/Challenges of Making This Cultural Shift
41	Stories of Impact
46	<b>References and Resources</b>



# INTRODUCTION

## ACCESSIBILITY AND INCLUSION AT MASS AUDUBON

Since 2008, Mass Audubon has developed and now operates 12 universally designed interpreted trail experiences called All Persons Trails. We have learned that the most effective way to design and provide a community resource is to work collaboratively with the community to develop that resource. Together you must take the time, and be open-minded and open-hearted about how the project will unfold. Engage the people and agencies who know about the concerns and needs of people who require accessibility accommodations. Be prepared to find inspiration and awe at the energy, commitment, and contributions of those who work to make the world more accessible and inclusive.

Mass Audubon strongly believes that all visitors should have opportunities to directly connect with the natural world. For decades we have worked steadfastly to improve the physical accessibility of our facilities and programs across the Commonwealth of Massachusetts. Most of our 20 nature centers, many of which previously were older private estates, have been renovated with ADA-compliant parking and entrances, admission areas, educational activity spaces, exhibits, galleries, and restrooms. Most also offer accessible outdoor wildlife observation structures, specialized gardens, seating, and picnic areas.

Since 2008, Mass Audubon's emphasis on accessibility and inclusion has expanded to include developing accessible, self-guided trail experiences for visitors with a wide range of functional abilities. Across Massachusetts, we have developed and opened 12 universally designed All Persons Trails. These trails include accessible interpretation available in multiple print formats, in signs installed along the trail, in audio formats, and on our website. Our work to develop and operate All Persons Trails is ongoing. We will eventually have All Persons Trails available at 20 locations.

Accessibility and inclusion is a key organizational priority for Mass Audubon. Goal One in Mass Audubon's Strategic Plan 2020—*Connect People and Nature for the Benefit of Both* — includes the action item “Advance Universal Accessibility at Our Sites, ensuring that our nature centers are

accessible and that all staffed sanctuaries will have universally accessible trails.” The Strategic Plan also specifically identifies as one of five cross-cutting Organizational Imperatives to “Embrace Diversity,” including “Ensuring Programming that Serves a Diverse Audience....ranging from environmental education curriculum in urban school districts to programs serving immigrant communities across the state to universal trails and facilities.”

Our progress continues as we further improve facility accessibility and the universally designed trail experiences statewide. We plan to develop and offer adaptive educational programming and to support the professional development needed for all staff and volunteers to build competency and comfort in welcoming visitors of all abilities and provide them with an inclusive environment for engaging with and learning about the natural world.

Having designed, operated, and evaluated 12 All Persons Trails, we have learned much about removing physical barriers on outdoor trails, designing accessible and enriching trail experiences for all visitors, and developing and installing universally designed trail materials available in multiple formats. This publication is designed to share the guidelines we have developed, the best practices we have learned, and what Mass Audubon is continually doing to strengthen the effectiveness of our All Persons Trails.





Stony Brook Wildlife Sanctuary

Mass Audubon's 12 All Persons Trails were developed and are all operating within the state of Massachusetts. As such, this manual contains many Massachusetts-specific references and regulations. Trails being planned in other states will need to follow the applicable regulations in those jurisdictions.



## MASS AUDUBON'S ALL PERSONS TRAILS AN OVERVIEW

Each year, a half million visitors explore Mass Audubon's wildlife sanctuaries. While many visitors are capable of navigating our extensive and rugged hiking trails, we recognize that a significant portion—one-sixth of the general population—has some disability limiting the type or length of trail that can be physically negotiated.<sup>1</sup>

To best meet the needs of all our visitors, and to invite everyone to connect with the natural world, we are working to create universally designed trails at 20 Mass Audubon wildlife sanctuaries with nature centers. Mass Audubon's nature centers are at wildlife sanctuaries designed for visitation and educational programming. They have accessible parking, restrooms, admission areas, and program spaces. In addition to providing visitor service and educational opportunities, staff and volunteers also manage wildlife habitat, conduct ecological research, and work on local

land protection and conservation policy initiatives.

For each accessible trail, our approach is to design and build a trail that is a rewarding experience, to be comfortably and safely navigated by all visitors, including those with mobility, vision, or other physical, sensory, or brain-based functional limitations. At the same time, the trail will be welcoming and increase the accessibility and enjoyment for visitors who are new to spending time on nature trails. These trails are designed and constructed first to physically meet or exceed anticipated Americans With Disabilities Act (ADA) compliance; and then to incorporate universally designed interpretive features including educational stops, wildlife viewing boardwalks and platforms, picnic and play areas, and navigation resources including audio directions, guide ropes, curbing, and handrails.

<sup>1</sup> United States Census Bureau

All Persons Trails create more inclusive outdoor experiences for all, including individuals who have not traditionally had independent access to natural areas and interpretive experiences. Our long-range strategic goals are to engage more people in protecting the nature of their communities and to strengthen the connection that all people have with the natural world through outdoor experiences, all toward building a conservation ethic.

In addition to providing nature trails that are smooth, with gentle grades for improved access by foot, stroller, or wheelchair, the All Persons Trail elements include:

- Sensory-rich audio tours (available by cell phone and/or audio players)
- Braille texts and tactile maps
- Tour booklets and maps designed for high readability for visually impaired and sighted visitors
- New orientation maps and outdoor trail information panels
- Improved signage (also braille) along trails
- Wider boardwalks with bumpers as needed
- Post-and-rope guiding systems (with detailed navigation information in the audio tour)
- Online information including maps, audio tours, and accessibility information
- Interpretive content focusing on the natural and cultural history of each site, along with the conservation practices and sustainability features, including the use of sounds and rich, verbal descriptions on the audio tours
- Staff and volunteers familiar with regulations and resources, and trained to support accessible, inclusive customer service and trail experiences

To date, we have installed All Persons Trails at these sites in Massachusetts:

1. Stony Brook, Norfolk (2008)
2. Broadmoor, Natick (2009)
3. Arcadia, Easthampton (2011)
4. Attleboro Springs, Attleboro (2011)
5. Blue Hills Trailside Museum, Milton (2012)
6. Wellfleet Bay, Wellfleet (2012)
7. Broad Meadow Brook, Worcester (2012)
8. Drumlin Farm, Lincoln (2013)
9. Pleasant Valley, Lenox (2013)
10. Boston Nature Center, Mattapan (2013)
11. North River, Marshfield (2015)
12. Habitat, Belmont (2016)



Wachusett Meadow  
Wildlife Sanctuary

Mass Audubon's mission of protecting the nature of Massachusetts for people and wildlife is greatly advanced by connecting more people with nature. More people are able to enjoy outdoor experiences on the All Persons Trails, and they can gain a greater understanding of the natural world. Ultimately, our objective is to have people interested in learning more and participating in conservation actions.



# GUIDELINES FOR PLANNING, DESIGNING, AND CONSTRUCTING ACCESSIBLE TRAILS



## PLANNING A REWARDING NATURE EXPERIENCE FOR ALL

Mass Audubon develops All Persons Trails so users can have a rewarding nature experience. This is quite different from simply taking a walk outdoors. Our approach is to reveal and link key elements within our wildlife sanctuaries, and provide interpretation of aspects of the natural world, so our visitors can learn about nature while immersing themselves within it.

Mass Audubon's mission is to protect the nature of Massachusetts for people and wildlife, and to educate people about their natural environment. Nature trails with interpretation are an ideal platform for our work, which is why we strive to create trails that form a series of links to varied, interesting, and representative features of the habitat in which they are located.

Our trail planning and design process typically begins with an exploration and accounting of a sanctuary's salient features. It proceeds with the goal of connecting as many of these features as possible. If successful, we create a trail that reveals, for example, a representative landscape, an interesting or unusual habitat, and a remarkable view or two.

All Persons Trails follow the same formula, but with the additional goal of ensuring that the chosen route can be made accessible without undue alteration to the landscape. When people experience our trails, our goal is that they develop a stronger connection to nature, a greater understanding of the natural world, and that they feel personally interested in learning more and in participating in conservation-minded behaviors.

The following sections provide an overview of the federal and state regulations and standards for accessible trails, and outline the process Mass Audubon utilizes in developing its accessible trails, as well as the considerations given to a wide range of trail planning, design, and construction factors.

## ACCESSIBILITY REGULATIONS AND ACCESSIBLE TRAIL STANDARDS

In general, the development and communication of accessible trail standards and regulations has lagged behind other accessibility regulations, although progress has advanced over the past 20-plus years, with the federal government taking the lead.

Many aspects of the built environment are covered by United States Access Board's Architectural Barriers Act (ABA) of 1968, and the U.S. Department of Justice's Americans with Disabilities Act (ADA) of 1990. The Access Board also maintains guidelines for non-federal facilities covered by the ADA. These guidelines serve as the basis for ADA Standards issued by the Department of Justice (DOJ) and, in the case of facilities used to provide designated public transportation, the Department of Transportation (DOT). In 2004, the Access Board jointly updated its ADA and ABA guidelines to make them more consistent. As a result, the current ABA Standards and ADA Standards are very similar, but there are several substantive differences between them.<sup>1</sup>

One difference is that the ABA Standards address access to outdoor areas developed or funded by the federal government, including trails, picnic and camping areas, and beach access routes. The Department of Justice's 2010 ADA Standards for Accessible Design, on the other hand, do not include similar requirements for non-federal sites. As a result, there are currently no universal standards that are mandated for accessible trails on state, municipal, or private property.

Accessibility standards for outdoor facilities generally address the specific facilities and the means by which people access them, known as "access routes." For example, a picnic area is a public facility that must be accessible by ADA standards. To achieve accessibility, the facility must be served by an accessible parking area, and an access route

<sup>1</sup> ABA and ADA Guidelines (2014)  
[access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/ada-aba-accessibility-guidelines-2004](https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/ada-aba-accessibility-guidelines-2004)

that allows people with disabilities to travel from the parking area to the picnic area. Access routes are not the same as trails. When developing an access route, specific design requirements must be met. For example, an access route walkway grade may not exceed 5% without having a handrail. Further, under no circumstances can an access route walkway exceed an 8% grade.

The Department of Justice's 2010 ADA Standards for Accessible Design set "minimum requirements for newly designed and constructed or altered state and local government facilities, public accommodations, and commercial facilities to be readily accessible to and usable by individuals with disabilities." It is important to note that the DOJ standards specifically address buildings and "facilities" that are open to the public. Outdoor facilities, such as swimming pools, tennis courts, exhibits, etc., are subject to the regulations and require compliant "access routes" per the regulations. However, as of this writing, outdoor trails developed specifically to provide access to the natural environment are not covered by the DOJ's standards.

There are situations where a certain segment of an outdoor trail is subject to the DOJ standards. An example would be where an outdoor trail also serves as an "access route" that leads to an outdoor facility. A trail may be designed to connect various natural features, but also brings people to an outdoor "facility," such as a boat launch or program area. In such a case, the trail segment that leads to the facility must be designed to meet access route standards. Under these circumstances, it is important to determine which segments of a proposed outdoor trail are subject to the DOJ standards.

The U.S. Forest Service has perhaps the most well-developed guidelines for accessible trails, but its trail standards only govern trails developed on lands that it controls. Nevertheless, many entities—including Mass Audubon—use the Forest Service's guidelines to identify best practices for maximizing accessibility of their trails.

## MASSACHUSETTS' ACCESSIBLE TRAILS

There are no universally adopted regulations that apply to the development of outdoor trails on state, municipal, and private property in Massachusetts. As such, Mass Audubon has voluntarily based its accessible trail design on the U.S. Forest Service's Trail Accessibility Guidelines (FSTAG). These guidelines, updated in 2013, reference applicable provisions of the Architectural Barriers Act Accessibility Standards (ABAAS). Over time, Massachusetts and other states may develop their own regulations for outdoor trails, or adopt a version of the FSTAG. In the interim, entities that seek to develop accessible outdoor trails are well advised to use the FSTAG as an informal standard where other accessibility requirements are either not applicable or nonexistent.

The Massachusetts Department of Public Safety regulates accessibility through its Architectural Access Board (AAB). The AAB's legislative mandate states that "it shall develop and enforce regulations designed to make public buildings accessible to, functional for, and safe for use by persons with disabilities. In addition AAB notes these regulations are designed to provide full and free use of buildings and facilities so that persons with disabilities may have the education, employment, living and recreational opportunities necessary to be as self-sufficient as possible and to assume full responsibilities as citizens."

The AAB regulations apply to facilities such as swimming pools, tennis courts, exhibits, and boat launches and require such facilities to have compliant access routes. However, as of this writing, outdoor trails developed specifically and exclusively to provide access to natural features in the environment are not covered by the AAB regulations.

The distinction between access routes and accessible trails is important. Access routes are the necessary connection between accessible buildings or accessible facilities, and are regulated by the AAB; accessible trails are not regulated by the AAB. There are situations where certain segments of an outdoor



Adaptive Hikers at Mt. Tom © Massachusetts Department of Conservation and Recreation

trail are subject to the AAB regulations, such as when a portion of an accessible trail also functions as an access route. Under these circumstances, it is important to be aware of which segments of an outdoor trail are subject to AAB regulations, and which would be subject to other trail guidelines (e.g., FSTAG).

The Massachusetts Department of Conservation and Recreation (DCR) is the agency that manages the state's parks. Its mission is "to protect, promote and enhance our common wealth of natural, cultural and recreational resources." DCR's Trails Program "seeks to provide a safe, quality recreation experience for a diverse range of trail users while practicing sound stewardship of the Commonwealth's natural and cultural resources." Like Mass Audubon, DCR has developed outdoor accessible trails for the public's use, and is guided by the FSTAG, which it applies under certain specific conditions. DCR also has developed a Trails Guidelines and Best Practices Manual to provide "a consistent set of trail management policies, guidelines, procedures, and best practices in sustainable trail development."<sup>1</sup>



Guided Snowshow © Massachusetts Department of Conservation and Recreation

## TRAIL PLANNING AND SITE SELECTION

Planning for an accessible trail always begins with a consideration of the experience that will be made available to the trail user. At Mass Audubon, our wildlife sanctuaries include a wide range of habitats and landscape types. Since our mission is to educate people about the environment, we plan our trails so that trail users are exposed to a variety of habitats, landscape types, and special features, to make their visit rewarding, educational, and fun.

Another key consideration in planning any trail is its potential impacts on the immediate environment. Trails must be designed so that they are well-integrated into the landscape, with all potential environmental impacts identified and addressed in the planning and design process. Trail projects can potentially affect their natural surroundings by, for example, changing storm water patterns, creating soil erosion, and altering habitat. Such impacts can detract from the trail experience and from the opportunity to educate people about environmental appreciation and conservation.

Mass Audubon's accessible trails are typically designed as short loops, or a series of connected loops, that enable all visitors the opportunity to complete a circuit that connects a variety of features. Typically, we plan these trails to be from a half mile to one mile in overall length, though actual

<sup>1</sup> DCR (2014) <http://atfiles.org/files/pdf/MA-Trails-Guidelines-Best-Practices.pdf>



length often depends on site conditions. While trail distances may vary from site to site, and some sites have abbreviated options, we generally design each trail so that we offer a 45–60-minute interpretive experience.

The majority of Mass Audubon's trails are located at our staffed wildlife sanctuaries, and are planned so that they begin and end at our nature centers. Typically, our planning includes consideration of how we will provide accessible parking and drop-off areas, access routes to and from a staffed facility such as a nature center, accessible restrooms, and trailheads. Planning for the accessible trail typically proceeds based on the premise that trail users, including those requiring physical accessibility accommodations for trail surfacing, slope, and width, seek to negotiate the entire trail experience, independently if possible, or with a companion if needed. We strive to design trails that everyone can use from the parking/drop-off location, through the trail experience, and back. Our trail planning seeks to maximize independent use of the trails by all visitors, to the extent possible.

Beyond the technical aspects of trail planning, our main goal is to create a trail experience that is defined by a series of interesting natural features that play to four of our senses—sight, sound, touch, and smell. For this reason, we often refer to these trails as “sensory trails.” As we begin the planning process for our accessible trails, we are always on the lookout for opportunities to stimulate one or more of the senses, and then attempt to connect these opportunities into a cohesive trail experience.

## TRAIL DESIGN ELEMENTS

Just as every site is unique, so too are its trails. As such, the design of each accessible trail needs to be carefully considered by professionals who understand how to design trails for the best possible experience, the least environmental impact, and the greatest ability to successfully maintain the trail and all related elements. Mass Audubon's accessible trail projects often include the following elements:

### Accessible Parking and Drop-off Zones

Public facilities must include dedicated parking spaces for people with disabilities, as well as drop-off zones. In Massachusetts, the Architectural Access Board's regulations provide a formula for the number of spaces required for a facility and the dimensions of parking spaces and drop-off zones.

### Access Routes

As mentioned previously, walkways that connect “public facilities” are considered “access routes,” and their design and construction must follow applicable regulations. For example, a walkway that brings people from a parking lot to a visitor center is an access route, and as such cannot under any circumstances exceed an 8% grade. Similarly, a walkway that brings people from a visitor center to a picnic area or a boat launch is considered an access route. Even though Mass Audubon is focused on the design and construction of accessible trails, often the walkways we build to bring people to a trailhead also serve as an access route connecting public facilities, and must be designed accordingly. In contrast, walkways that serve only to bring people into the natural environment on private, state, or municipal property are considered outdoor trails, and typically are not subject to accessibility regulations.

### Trailhead

The trailhead, an open area at the entrance to a trail, provides an inviting, comfortable place to orient visitors to the trail system and provide basic information about the trail route, features, etc. Mass Audubon typically installs a trail map and pertinent trail information at the trailhead of each All Persons Trail. As part of the All Persons Trail, and to introduce the trail in a welcoming way, the trailhead area is ADA-compliant, often with mixed-use seating, allowing visitors to gather comfortably and read trail-related information.

### Trail Signage

In addition to the colorful entrance sign installed at each trailhead, we also install numbered stop markers, interpretive signs, and informational labels and markers along our All Persons Trails.



Arcadia Wildlife Sanctuary

Signs are an important way to provide information, and to make visitors feel safe and welcome. For sighted visitors, we install colorful signage that is professionally designed and fabricated in our design standards. For visitors with sight limitations, we install large print and tactile signage and labels where needed.

## Trail Design Considerations

As noted above, trail design begins with an initial reconnaissance of the area in which the trail is expected to be located. The trail alignment will be developed to create a varied experience, revealing and connecting interesting site features that can be interpreted, either on guided walks or with self-guided interpretation. Ideally, a trail is configured as a loop, but in some instances an out-and-back configuration, or a partial loop, is the most logical design. Typically, our trails are a half mile to one mile in length. As trail layout proceeds, important factors that will arise include consideration of materials to be utilized, proximity to wetlands, grade, drainage, obstacles, etc.

## Surfaces

Accessible trails need to have a firm, stable, and relatively smooth surface. Mass Audubon typically constructs its accessible trails with a treadway of crushed stone, composed of various sized particles no larger than a half-inch, and as fine stone dust, so that the mix compacts well and infiltrates water to some degree. Recently, we have experimented with using “GrassPave,” a plastic grid that is filled with loam, into which grass is planted. The result is a firm and stable treadway that is vegetated with turf. Beneath the treadway will typically be a layer of



Arcadia Wildlife Sanctuary

coarser material that provides structural strength and subdrainage for the trail. In areas where soils are frequently wet, or where standing water is present, we design boardwalks to span these conditions.

## Habitat Protection

Oftentimes wetlands present very interesting habitat and are valuable to educational and interpretive activities. However, building trails either in or near wetlands will require appropriate permits from local and/or state regulators. (See the Permitting section on page 13.) Wetland trails also typically require a different design approach due to the nature of the soils, the need to maintain water flow, and environmental regulations. In wetland environments, Mass Audubon often constructs boardwalks built on helical piers to minimize wetland or buffer zone disturbance. Helical piers, or screw anchors, are often favored by regulators because they require no excavation in sensitive wetland areas. The appropriately selected piers are simply screwed into the soil to a calculated depth to provide support for the boardwalk structure and pedestrian loads.

## Storm Water

Regardless of where a trail is built, storm water flows must be considered during the design phase, to ensure that the existing area’s runoff pattern is maintained and accommodated, and that the new trail is not adversely affected by concentrated flows across or along it. For trails constructed of granular materials, such as crushed stone, various techniques can be utilized to ensure proper storm water flow and trail longevity. A basic technique is to design proper cross-pitch into the trail surface so that water does not puddle on the trail, but flows



gently off to one side. Additional techniques include constructing culverts, drainage dips, and subsurface drainage channels where appropriate.

## Grading

Grading is one of the most important considerations when designing trails for accessibility. When developing a new trail, a primary consideration is the suitability of the site for an accessible trail. It is crucial to first carefully assess the site and potential trail alignments to determine if the terrain can accommodate an accessible trail without undue disturbance to the landscape. A valuable tool for site assessment is a topographic survey of the property that includes key site features such as structures, large trees, stone walls, water bodies, and wetlands. The survey can also serve as the base for design work if the property is suitable for a trail.

Once the site is deemed suitable, applicable trail grading standards should guide the design of the trail layout. Mass Audubon adheres to the U.S. Forest Service's Trail Accessibility Guidelines when developing the grading plan for its trails. These guidelines vary from those of typical access routes that connect public facilities, such as a parking lot and a building. Whereas an access route may not have a slope greater than 5% (1:20) without a handrail, the FSTAG allows for trail sections with a slope of between 5% and 12% (1:8.33) for up to 50 feet, and sections with a slope of 12% to 10% (1:10) for up to 30 feet, without handrails. The trail guidelines therefore offer greater flexibility in grading than typical access routes, but still incorporate reasonable limits so trails can be negotiated by people with a full range of physical abilities, with or without the aid of a mobility device.



Pleasant Valley Wildlife Sanctuary



Arcadia Wildlife Sanctuary I



Broad Meadow Brook Education Center & Wildlife Sanctuary



Stony Brook Wildlife Sanctuary





Pleasant Valley Wildlife Sanctuary

## Trail Development and Environmental Sustainability

Trails are typically not intensive developments that have a large impact on the environment. However, several considerations should factor into any trail project to make the trail as environmentally sustainable as possible. As noted above, impacts on wetland resources and sensitive habitats must always be avoided. Construction methods and material selection are important considerations as well. For example, for many years footings for boardwalks have been constructed by excavating soil and pouring concrete to support boardwalk footings. More recently, helical piers, or screw anchors, have become popular because they require no excavation and no concrete, minimizing disturbance to the environment.

Boardwalk construction presents an opportunity to consider the many materials that are available, and their relative environmental impact.

Mass Audubon has utilized a wide range of materials for its boardwalks over the years. For the structural components, we use pressure treated wood. Where appropriate, pressure treated wood is longer lasting and resistant to insects, mold, and rot. For decking, we have used various composite materials, typically composed of wood fiber and recycled plastics. More recently we have increased our use of black locust lumber as decking, due to its natural rot resistance and absence of chemical additives.

During trail construction, it is important to manage the movement and storage of materials so that dust, sediment, and water do not impact natural resources, people, or wildlife. Further, it is important to consider how much waste the project will generate, how construction waste can be minimized, and how waste materials can be reused or recycled.

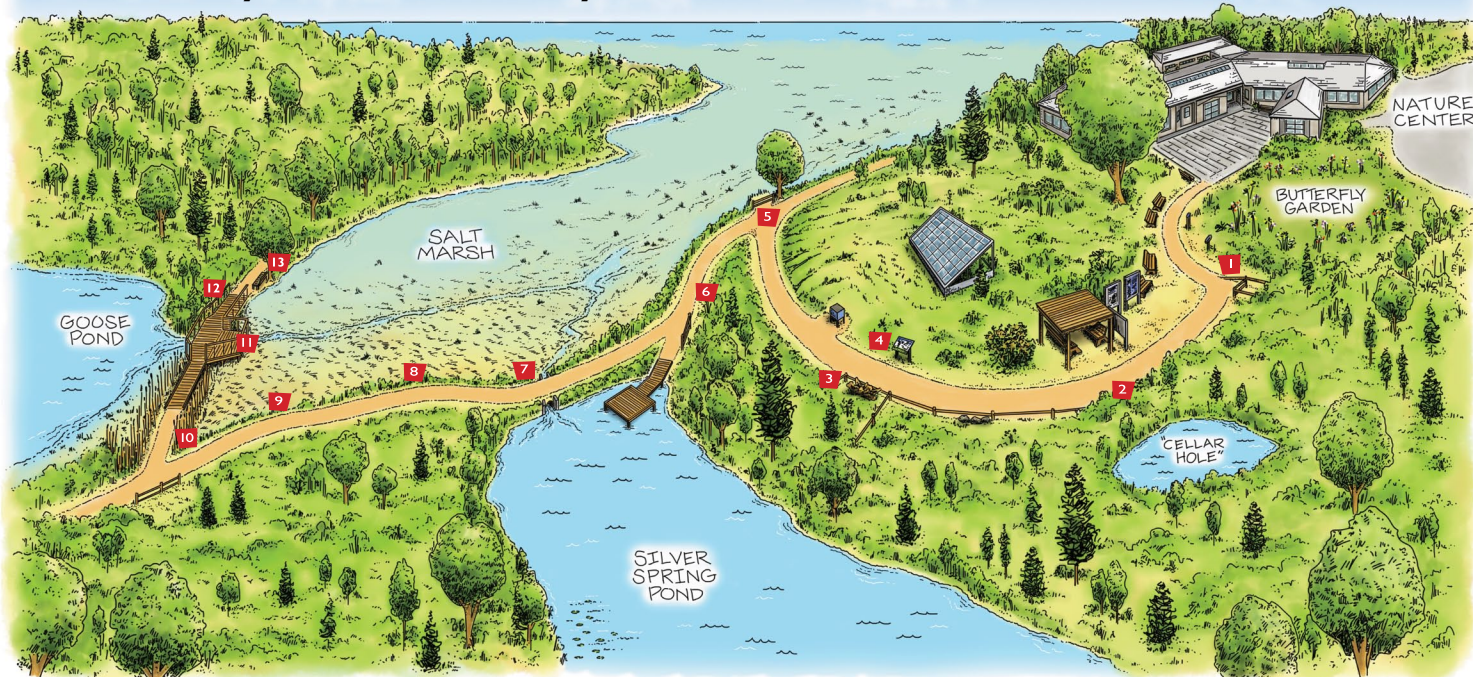


## Trail Mapping

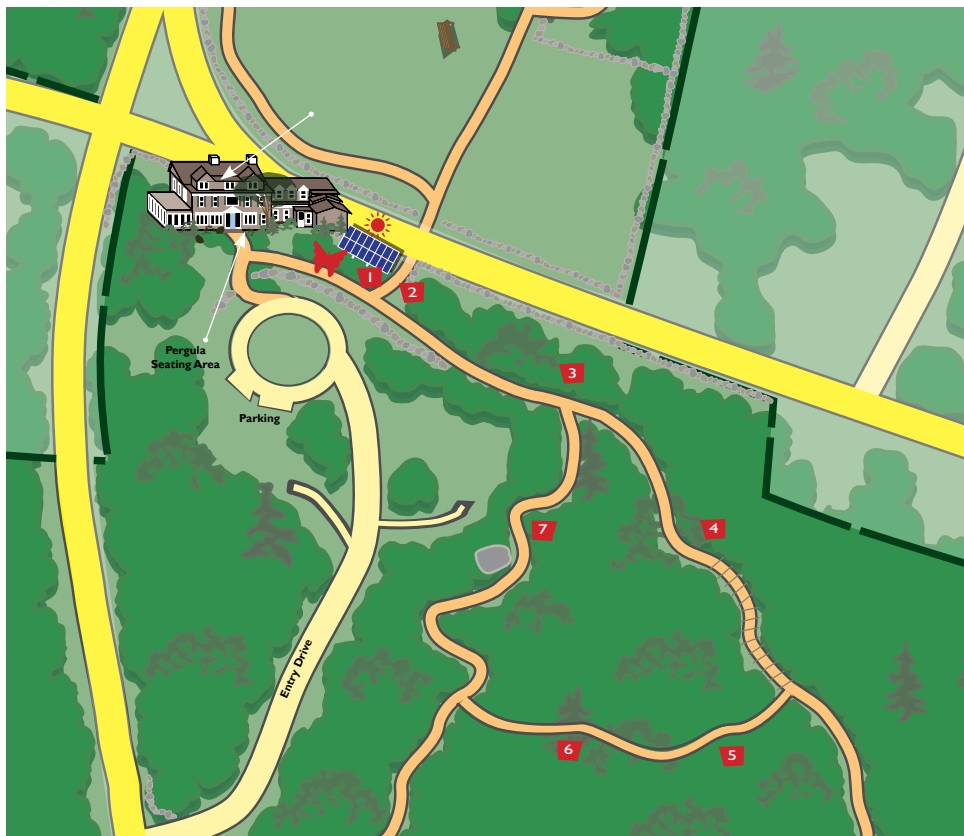
Trail maps are one of the most important tools we have for inviting visitors to use our trails, providing quality user information, managing user expectations, minimizing conflict, and promoting safe

and appropriate trail use. Mass Audubon trail maps are illustrated by artists or produced by a digital map company. Here are two examples of trail maps produced for Mass Audubon wildlife sanctuaries with All Persons Trails.

### Wellfleet Bay Wildlife Sanctuary



### North River Wildlife Sanctuary



## REGULATORY CONSIDERATIONS

### **United States Access Board Architectural Barriers Act (ABA)**

Standards issued under the Architectural Barriers Act (ABA) apply to facilities designed, built, altered, or leased with certain federal funds. Passed in 1968, the ABA was one of the first laws to address access to the built environment. The law applies to federal buildings, including post offices, social security offices, federal courthouses and prisons, and national parks. It also covers non-federal facilities, such as public housing units and mass transit systems, built or altered with federal grants or loans. Coverage is limited to those funding programs that give the federal agency awarding grants or loans the authority to establish facility standards.

The ABA Standards also address access to outdoor areas developed by the federal government, including trails, picnic and camping areas, and beach access routes.

### **US Department of Justice 2010 Standards for Accessible Design Title II Standards: State and Local Governments Design and Construction**

The U.S. DOJ Standards are silent with regard to trails in the outdoor environment. It is important to note that the DOJ standards specifically address buildings and “facilities” that are open to the public. Outdoor facilities, such as swimming pools, tennis courts, and exhibits are subject to the regulations, and require compliant “access routes” per the regulations. However, as of this writing, outdoor trails developed specifically to provide access to natural features are not covered by the DOJ’s standards.

### **The U.S. Forest Service Trail Accessibility Guidelines**

(FSTAG) provide guidance for maximizing accessibility of trails in the National Forest System, while protecting the unique characteristics of their natural setting. The FSTAG and the Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) are the legally enforceable standards

for use in outdoor recreation areas in the National Forest System for the facilities, routes, and features addressed in these guidelines. Although not legally enforceable outside of the National Forest System, the guidelines may be used by other entities to define best practices for trails. The FSTAG and FSORAG became the National Forest System’s legal standard for all applicable facilities on May 26, 2006, with the final Federal Register publication of Forest Service Manuals 2330 and 2350.

### **Commonwealth of Massachusetts Architectural Access Board**

The Architectural Access Board (AAB) is a regulatory agency within the Massachusetts Department of Public Safety. Its legislative mandate states that it shall develop and enforce regulations designed to make public buildings accessible to, functional for, and safe for use by persons with disabilities.

[mass.gov/eopss/architectural-access-board.html](http://mass.gov/eopss/architectural-access-board.html)

## PERMITTING

Any disturbance to the natural environment has impacts, and trails are no exception. When we construct or maintain trails, we should make every effort to do no harm. As discussed above, ideally trails should be routed to avoid sensitive resources such as streams and wetlands, rare species habitats, and sensitive cultural sites. However, trail development within or alongside sensitive areas is often necessary and justifiable. Streams need to be crossed, steep slopes traversed, and unique features interpreted. Allowing controlled access to sensitive ecological or cultural areas may also be an integral part of educating the public about the value of protecting these resources. When sensitive areas cannot be avoided, trail builders have legal and ethical obligations to minimize our impacts by going through the proper regulatory procedures. Following are some of the state regulations and permits that must be considered when developing a trail.

**Streams, Rivers, and Wetlands:** In Massachusetts, activities occurring within 100 feet of a coastal or inland wetland or within 200 feet of a perennial stream or river are governed by the Wetlands



Protection Act. Among the many activities regulated by this act are changing runoff characteristics, diverting surface water, and the destruction of plant life—activities commonly associated with trail building and maintenance. If trail building activities will occur within 100 feet of a wetland or 200 feet of stream or river, a “Request for Determination of Applicability” (RDA) form must be filed with the local conservation commission. The local conservation commission can explain the state regulations and local bylaws; they can also provide guidance on completing your RDA. To determine if your trail project will occur near a wetland, use the wetlands online viewer: [maps.massgis.state.ma.us/images/dep/omv/wetviewer.htm](https://maps.massgis.state.ma.us/images/dep/omv/wetviewer.htm). If your project occurs near a wetland identified on this map, you will need to submit an RDA. Be advised that not all wetlands are indicated on this map, so an RDA may be required even if no wetlands are indicated on the online viewer.

**Threatened and Endangered Species:** More than 440 species of plants and animals are protected under the Massachusetts Endangered Species Act (MESA). MESA protects state-listed rare species and their habitats by prohibiting the “take” of any species that is listed as Endangered, Threatened, or of Special Concern. A “take” is any activity that directly kills or injures a MESA-listed species, as well as activities that disrupt rare species behavior and their habitat. Trail building activities are subject to review by the Massachusetts Natural Heritage and Endangered Species Program if they occur in areas that have been delineated as “Priority Habitat.” You can determine if your project will occur within Priority Habitat with the help of the Priority Habitat online viewer ([mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/regulatory-maps-priority-and-estimated-habitats/](https://mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/regulatory-maps-priority-and-estimated-habitats/)). If your trail project is located within a Priority Habitat area, you must file a MESA project review checklist. This checklist may be found at [mass.gov/eea/docs/dfg/nhESP/regulatory-review/ mesa-proj-review-check-elect.pdf](https://mass.gov/eea/docs/dfg/nhESP/regulatory-review/ mesa-proj-review-check-elect.pdf).

**Archeological and Cultural Resources:** Any soil disturbance activities, such as trail building, that are on state property or funded through state or

federal funds (including Recreational Trails Grants) require review from the Massachusetts Historical Commission ([sec.state.ma.us/mhc/](https://sec.state.ma.us/mhc/)) and the filing of a Project Notification Form. If the project is not in an area with archeological and/or cultural resources, the MHC will require nothing further. If the project is in such an area, the MHC may request an archaeological survey, which would require hiring a private archaeologist.

**Historic Landmarks:** In certain cities and town, all or some of the parks have been designated as local historic landmarks. Chestnut Hill Reservation, for instance, is considered a Boston Landmark. Any work in the area, design and construction, has to be reviewed by the local historic landmark board before work can begin.

## STRUCTURES

Many accessible trails are constructed entirely by excavating existing soils and replacing them with a suitable trail surfacing material, such as crushed stone. However, under certain conditions a trail cannot be created simply by excavation and/or filling and will require the design and construction of a trail structure. Trail structures typically take the form of boardwalks, overlooks, or bridges. Since structures are usually more expensive to build than a standard trail, a structure would only be introduced when absolutely necessary. Examples of conditions that may necessitate a trail structure include wetland crossings, spanning a stream, difficult terrain, or sensitive habitat, where excavation or fill is not advised or not permitted.

When it has been determined that a trail structure is the best method of addressing a trail design issue, it is important to engage the services of a qualified person or firm to design the structure. Many municipalities now require a building permit for outdoor structures, and in order to obtain a building permit, the structure’s design will first need to be certified by a qualified design professional.

If a trail structure is contemplated for a location that is near or within wetlands or a wetland buffer



Arcadia Wildlife Sanctuary



Habitat Education Center & Wildlife Sanctuary

zone, a consultation with the local conservation commission is always a good first step. This can help the landowner understand the feasibility of building a particular structure, the conditions that may be placed on the work, and the requirements that will need to be satisfied to gain permission to build the structure.

Mass Audubon has found that, particularly in locations that involve impacts on wetland resources, the use of helical piers to create suitable structural footings is often favored by conservation commissions, due to the low impact associated with their use. As opposed to traditional footings made of timber or concrete, helical piers are essentially large metal screws that are driven into the ground without the need for excavation and backfill.

## CONSTRUCTION

Trail construction may not seem complicated; however, trail construction is similar to many other types of construction projects, and as such many factors need to be considered before embarking on the work. These factors include, but are not limited to:

- Engaging a qualified company or individuals with trail building experience
- Planning for construction logistics, such as delivery and storage of materials, and transport of materials within the project area
- Having the proper equipment to perform excavation, backfilling, and compacting operations
- Construction knowledge with regard to creating and verifying proper grades, creating drainage structures and/or subsurface drainage, and construction methods for trail structures
- Ensuring that both workers and the public are as safe as possible at all times

While volunteers can build rudimentary trails at very low or no cost, their skills and ability are often limited. Further, volunteers typically do not carry insurance, and this can pose a liability issue for many organizations. Mass Audubon covers its volunteers under its workers' compensation insurance, but many organizations are unable to do this. For the great bulk of its trail building efforts, Mass Audubon typically engages professional trailbuilders who carry liability and workers' compensation insurance, both for their protection as well as the owner's. Further, we have found that the members of the Professional Trailbuilders Association (PTBA) bring the skills, experience, and resources we need to create great trails. For more information about the PTBA, see [trailbuilders.org/](http://trailbuilders.org/)

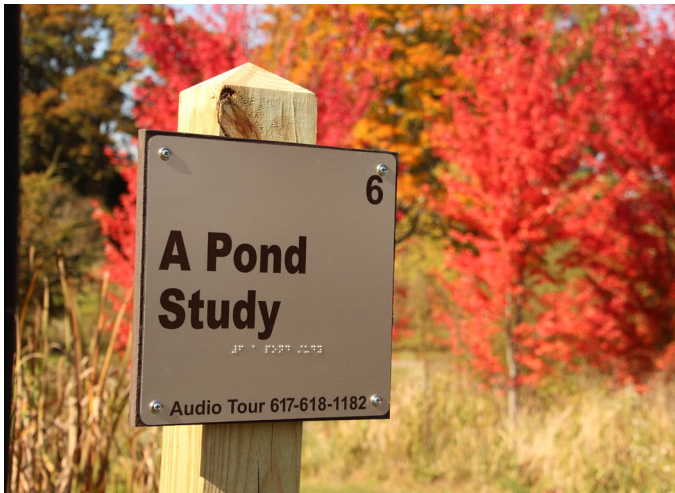
in recognition of the sensitive nature of the lands we manage, but also recognizing the intent of the DOJ regulations. ([massaudubon.org/content/download/7709/142706/file/Procedures-for-OPDMD-9-12.pdf](http://massaudubon.org/content/download/7709/142706/file/Procedures-for-OPDMD-9-12.pdf))

## **OTHER POWER-DRIVEN MOBILITY DEVICES (OPDMD)**

The US Department of Justice (DOJ) amended the Americans with Disabilities Act (ADA), Title II regulation, 28 CFR Part 35, effective March 15, 2011, to permit the use of "Other Power-Driven Mobility Devices" on outdoor trails. An "other power-driven mobility device" is anything with a motor that can be driven, regardless of size or horsepower, if it is driven by a person who has a mobility related disability. Per the Department of Justice, OPDMD's are distinct from wheelchairs, which must be allowed to be used anywhere, with no exceptions. In contrast to wheelchairs, the use of OPDMD's can be restricted by a landowner.

Any organization that owns and manages outdoor trails should be aware of the provisions of the DOJ regulations, as they establish requirements for landowners to permit the use of certain powered vehicles on their trails. However, the use of such devices is subject to reasonable restrictions per a written policy established by the landowner. Mass Audubon has created such a policy and guidelines





All Photos: Boston Nature Center

## SUMMARY

### Guidelines for Planning, Designing, and Constructing Accessible Trails

- ☐ Begin your trail planning process with an approach that can be made accessible without undue alteration to the landscape and that connects the features you want visitors to experience
- ☐ Refer to state and federal regulations, guidelines, and standards to guide trail planning, design, and construction
- ☐ Work to minimize potential impacts on the immediate environment, including stormwater
- ☐ Adhere to ADA accessibility standards for facilities, access routes, and other visitor amenities where applicable
- ☐ Consider the experience that will be available to trail users; bring them to a variety of habitats, landscape types, and special features, to make their visit rewarding, educational, and fun
- ☐ Make sure trail entrances begin and end near accessible parking and drop-off areas, access routes to and from a staffed facility such as a nature center, accessible restrooms, and trailheads
- ☐ Utilize professional trail designers and builders as needed
- ☐ Acquire all necessary permits for work near wetlands and sensitive habitats, archeological and cultural resources, or historic landmarks before beginning any trail construction work





# **AN INCLUSIVE APPROACH TO DEVELOPING ALL PERSONS TRAILS**

In 2010, after opening and operating our first two All Persons Trails, Mass Audubon was proud to be awarded the “Bay State Council of the Blind Community Access Award.” When we inquired about the details of our nomination and selection, we learned that it was because our first two All Persons Trails were developed through an inclusive process that involved expert users, testers, and resource professionals who were experienced, knowledgeable, and most important, representative of individuals requiring accessibility accommodations. The key aspect of receiving this award, we were told, was that we involved these individuals and professionals in planning the trail experiences and testing the drafted trail materials in development, and fully incorporated their input into the final trail plans, materials, and practices. This award-winning approach, we were informed, was not a general practice, something our testers and resource professionals confirmed. They consistently told us that they were often invited to ribbon-cutting events for some space or resource that had been universally designed for users of all abilities, their role being to enjoy the festivities and the space or resource designed with them in mind. But, often, the space or resource was not as accessible as intended, mainly because it was developed without the input of individuals whose involvement would have made the process and the resulting project more successful and accessible for a much broader audience.

Since receiving this award, and opening 10 more All Persons Trails, we have learned a lot about universal design and developing accessible trail experiences for visitors with a wide range of physical, sensory-based, and brain-based functional abilities. But the most important thing we learned early on in this work was the value and crucial importance of involving expert users and accessibility resource professionals in planning the trail experiences, producing the trail materials, and continuing to improve the effectiveness and user-friendliness of these trails.

## COLLABORATING WITH PARTNERS

Partnering with accessibility consultants and resource professionals is a key priority for effectiveness throughout the process of developing and successfully operating an All Persons Trail. Initially, we reached out to colleagues within our geographic region (Massachusetts) who were already working on accessible outdoor recreation and program activities, and we invited them to be involved in this project. Through that initial contact, we brought in these collaborative partners:

- Massachusetts Department of Conservation and Recreation (DCR) Universal Access Program coordinator and outreach coordinator
- Perkins School for the Blind Library director and several key library staff members
- Access Technology Accessibility consultant

These original partners have been extremely supportive and helpful, working with us continuously since 2008, as key contributors in several areas of the work. Volunteering, working with us as paid consultants, and providing in-service support for our work, our partners have provided us with countless crucial services, including:

- Planning, testing, and operating each All Persons Trail
- Finding local individual expert users and testers to help test and finalize planned trail experiences and interpretive materials
- Identifying local resource professionals (independent living agencies, disability services, etc.) who bring testers, help with planning, and provide key support for our ongoing outreach efforts
- Helping to write, review, and proofread all drafted visitor materials (including braille publications and signage) to ensure that trail information (navigational, descriptive, etc.) is accurate, helpful, user-friendly, and includes the most current and acceptable accessibility language
- Writing funding proposals for grants to develop additional All Persons Trails and associated projects



- Producing trail materials: creating tactile maps, publishing braille booklets, recording and engineering audio tours
- Conducting training for our visitor services personnel, property workers, and educators on accessibility and inclusive customer service
- Helping us produce a resource packet for all visitor services personnel on accessibility regulations and inclusive personal and telephone customer service
- Providing professional outreach services including submitting written articles to relevant publications and presenting many conference and training workshops throughout New England
- Helping us develop two organizational policy statements, “Service Animals” and “Mobility Devices” (available at [massaudubon.org/accessibility](http://massaudubon.org/accessibility))

It is difficult to adequately describe the degree to which these collaborative partners have enriched the planning process, strengthened the results of each planned trail, and helped us learn and build our capacity for being an inclusive organization. We already knew from our conservation and environmental education work that engaging new audiences and developing new programs must always start with learning about the audience by working directly with them, and not making assumptions or generalizations about what they need or want or how best to engage with them. Having this awareness and using this approach became even more crucial when we sought to create accessible trail experiences for all visitors to our wildlife sanctuary nature centers, including visitors with a broad range of physical, sensory, and brain-based functional abilities. Our collaborative partners have provided the crucial link for effectively engaging with this broader audience before, during, and after developing the All Persons Trails.

To find collaborative partners within your geographic region, reach out to resource professionals from independent living centers and agencies, social service agencies, veteran’s groups, and disability services organizations. Reaching out

to outdoor recreation professionals, especially those who coordinate adaptive outdoor recreation programming, can also be fruitful. Special Education teachers and coordinators in local school districts can also provide good networking connections. By reaching out to these types of professionals you can find potential partners for your accessible trail project.



Habitat Education Center & Wildlife Sanctuary

Once you assemble a team of collaborative partners, it’s important to provide them with opportunities to be useful, involved, and valued. Make sure to coordinate an initial meeting where they can meet each other and learn about their respective backgrounds and areas of expertise. Invite them to attend conferences, and to co-present workshops with others in the group, and provide them with assistance as needed. Support their organizations as well, through membership, attending networking events, and co-presenting at their conferences and trainings. Share the credit, always, with all the collaborative partners, accurately including their titles and their organizational affiliations. This will nurture the relationship you have with your partners and also add credibility and respect to your project, demonstrating that it was completed through an inclusive process and strengthened with the valuable guidance and expertise of resource professionals who are dedicated to increasing accessibility and inclusion.

## EXPERT USERS AND TESTERS

The collaborative partners play a key role by helping to test the planned trail stops and the drafted trail materials. Since your partners work as resource professionals for individuals and groups needing accessibility accommodations, they are very effective testers. Some project partners may also bring the personal perspective of needing specific accessibility accommodations themselves, which provides a rich opportunity for deeply honest and productive feedback for improving the planned trail. Your partners can also help recommend other testers among their clients, members, or professional and social networks.

Each of our All Persons Trails was tested during the planning stage with a group of five to ten people providing different perspectives of individuals requiring accessibility accommodations. Our accessibility partners provided us with local program participants, clients, and constituents. Local independent living agencies, teachers, and accessibility support services organizations were also asked to provide contact information for individuals we could invite to the testing sessions.

We invited the testers to a scheduled testing session typically set up like this:

10:30 am	Welcome and introduction to the project
10:45-12	Testers visit the proposed trail <ul style="list-style-type: none"><li>• Read the drafted interpretive text (or listen to the drafted audio script that will be read aloud) at the planned stops</li><li>• Use the drafted materials planned for trail users</li><li>• Follow the navigational instructions provided</li></ul>
12-1 pm	Facilitated discussion/feedback session (a light lunch was provided)

Each testing session provided significant input, enabling us to make adjustments and refinements to the planned trail stops and trail materials, including

navigational instructions, physical descriptions, trail improvements (such as locations of seating, railings, post-and-rope guiding systems), and trail materials (including audio tours, printed and online trail booklets, trail information). The importance of this step cannot be overstated—testing the planned trails and associated materials at an early stage with a group of expert users made all the difference in planning trails to be as user-friendly as possible, for the broadest audience possible. Engaging with testers before the trail activities and materials are completed requires time, energy, and commitment, all of which extend the planning process. At times this made it more complicated and time-consuming, but always resulted in creating much more effective trail experiences, suitable and welcoming for a much broader audience.

Here are some examples of revisions and refinements made as a direct result of tester input:

- Dividing one audio tour into multiple versions of the audio tour at some sites
- Convincing us that personal cell phones should be the primary way for people to access the audio interpretation, where possible, and to provide the audio in digital format online for people to download onto their personal audio players
- Helping us understand the importance of including, and repeating, very clear navigational instructions throughout the audio program, especially when the trail changes in any way (direction or surface material, for instance)
- Helping us gain a better understanding of how accessible trails involve more than the trails themselves: Public transportation and para-transit resources are just as important as the planned trails for inviting and engaging all visitors, and transportation information must be readily available wherever potential visitors get trail information
- Identifying what additional physical accessibility improvements were needed at our nature centers in order to extend visits



User expert testers helped us create 12 individual trail experiences that are unique, authentic, and natural, and that balance safety with the authenticity of an outdoor trail experience. While we must safely navigate visitors around hazardous rocks, trees, and other vegetation, we should not attempt to clear the trails of all natural features and textures. We worked on each trail to achieve the balance of safely helping visitors navigate the trails while also helping them experience the many natural sensory experiences on those trails, such as textures, smells, changes in microclimates, sounds, and more.

Testers can continue to be engaged with the project after the trail is ready for operation. Once each Mass Audubon trail was ready for opening, all the partners and testers were invited to the opening event. Those who attended were recognized for their contributions to the project. Testers often remain connected to and supportive of the trails, as visitors, providing user feedback for maintaining or improving the trails, and with outreach efforts, as supporters and advocates inviting others to learn about and use the trails. We also invited the testers back to help us evaluate how effectively these trails were operating and even to help us develop this guidelines publication.

## SUMMARY

### Guidelines for using An Inclusive Approach to Developing All Persons Trail

- ☐ Enter into the project with an open mind for using an inclusive planning process
- ☐ Understand that an inclusive planning process requires more time and energy, a willingness to share ownership of the project: and it will yield different, but better results than you expected
- ☐ Find and involve expert users, testers, and resource professionals who are experienced, knowledgeable, and representative of individuals requiring accessibility accommodations
- ☐ Collaborate effectively with accessibility partners by clarifying roles and expectations, and expressing appreciation and respect for everyone involved throughout the project
- ☐ Have testers and partners review and test all planned trail features, stops, and materials; accepting and incorporating their feedback and suggestions will make the trail much more user-friendly
- ☐ Be willing to adapt your original trail vision and plans; your partners and testers know more than you do about the needs and expectations of trail users who need accessibility accommodations
- ☐ Invite your partners and testers to stay involved with trail evaluation, upkeep, and refinements



© Janet DiMattia



Top left: Wellfleet Bay  
Wildlife Sanctuary

Top right and bottom:  
Stony Brook Wildlife  
Sanctuary Sensory Trail

# GUIDELINES FOR CREATING TRAIL EXPERIENCES AND TRAIL MATERIALS



Mass Audubon strives to welcome and engage a wide range of visitors. By making our 20 nature centers more accessible, and by creating accessible trail experiences, we're working hard to ensure that everyone can strengthen their connection to the nature of Massachusetts. The public facilities at most of our centers are universally accessible, and 12 of our wildlife sanctuaries now feature an All Persons Trail, affording a rich experience for visitors with a wide range of vision, hearing, and mobility levels.

The All Persons Trails each have a combination of these resources:

- Audio tours available by cell phone, online, or on a borrowed audio player
- Trail information booklet available online, in large print, and in braille
- Trail map available in printed and tactile formats
- Post-and-rope guiding system
- Stops that are designed for sensory-rich audio and tactile exploration
- Signage along the trail marking the stops with large print and braille
- Improved trail surfacing and wider boardwalks with safety edging
- Accessible seating areas
- Orientation materials and information panels
- Visitor services staff and volunteers who have been trained in accessibility regulations, customer service, and etiquette

The best practices we developed while creating the multisensory trail experiences included physical guiding systems for navigation and safety, evaluation protocols, and production of associated interpretive materials in a variety of formats. Interpretive content centered on the natural and cultural history of each trail, and included everything from descriptions of stone walls and farming in Colonial times, to vernal pools, to bird identification. By adding audio and sensory elements, plus braille interpretation, to our accessible trails, we have opened up the outdoor world to many new audiences. These experiences—sensory-rich, tactile, universally themed, and available in multiple formats onsite and on our website—can be enjoyed by all of our visitors.

Where needed, we have made trail safety improvements, such as widening boardwalks and adding bumpers or other forms of safety edging. Also where needed, we have redesigned or added seating areas so they are situated in more locations along a trail and designed to accommodate mixed use, including room for visitors who are using mobility devices.

We have learned that being inclusive and welcoming extends beyond the development of the trails and trail materials. It is very important to provide “know before you go” information and resources to potential visitors. The trail maps, audio tours, accessibility information, and site information are all included on our website ([massaudubon.org/accessibility](https://massaudubon.org/accessibility)) enabling visitors to access this information prior to their visit.

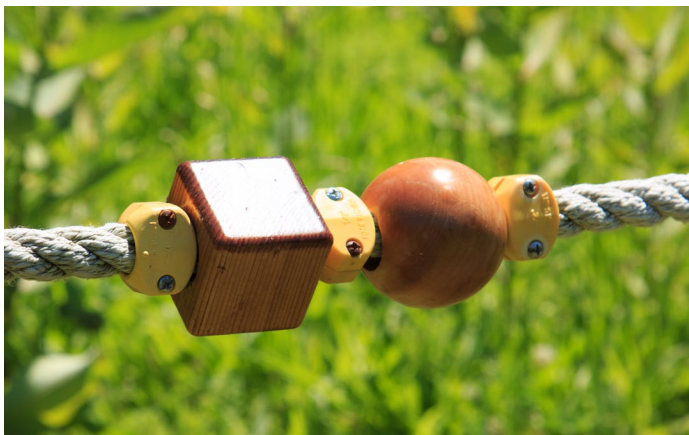
#### **Testimony from a visitor:**

“I used to go to my local Mass Audubon wildlife sanctuary and spend a few hours sitting on the deck listening to birds. I enjoyed the experience, but it was limited. I could smell the flowers and listen to the birds, but that was about all I could do. Now that an accessible trail has been completed there, today, I can go back to that same place without assistance. On the mile-long rope-guided trail, I can independently walk through a butterfly garden, visit the bird blind, examine and learn about various types of tree bark, visit and learn about a wetland and a frog pond, touch a 90-foot-tall oak tree that was there when Teddy Roosevelt was president, and put my hands in a fountain containing a tactile representation of the local watershed. That's a big difference. These accessibility enhancements have made a huge difference to me personally and I know they have to other people with disabilities also.”

## NAVIGATIONAL RESOURCES

When designing a trail experience for visitors with a wide range of vision abilities and limitations, it is important to include navigational resources. These can include post-and-rope guiding systems, railings, descriptions of physical changes in the trail, curbing, and information on trail surfacing. Trails and facilities will lend themselves to varying degrees of navigational resources, and each site will have its own level of navigability for visitors to experience the trail independently or with assistance. In all cases, detailed navigational information should be included in the trail information and materials. To the extent possible throughout the trail, the ideal navigational system that allows for the greatest independent use of the trail by sight-impaired visitors is the rope guide, sometimes alternating with a boardwalk hand rail or other tactile guiding structure. Nautical rope is threaded through upright posts every eight feet.

Round wooden or plastic beads are secured along the rope to indicate that an interpretive stop is within reach. Square wooden or plastic beads secured along the rope indicate that seating is nearby, with specific instructions on how to find it, and what type of seating it is.



Railings can be an effective guiding system, as long as they are fairly continuous and safe to use. Some of the wooden railings that have been in place for years have been smoothed by time and use. Others have splintered surfaces, rough edges, or uneven intersections that are uncomfortable and unsafe for

visitors, so the top boards must be either replaced or covered with a protective layer. In addition to being splinter-free, the surface material should stay comfortable in all weather, not getting too hot or too cold with changing seasonal temperatures. We found that roofing material or plasticized lumber work well as the top layer on wooden railings.



In addition to the physical navigational resources such as post-and-rope guiding systems, beads, and railings, we have found it also important to describe the physical nature of the trail with as much detail as possible. This includes providing information on distances, width, elevation, direction, curbing, surfacing materials, and other physical changes, as well as changes users might expect as they encounter changing trail conditions and natural microclimates.

## SIGNAGE

### Trail Entrance Sign Panel

A large and colorful orientation map and information panel is installed at the beginning of each trail, physically illustrating and describing the trail in detail, and inviting visitors to visit the trail, using their senses. We also include information about all the trail materials available in different formats (audio tours, braille booklets, tactile maps, etc.) and how to access them. Donors and other contributors are acknowledged if appropriate. The information included on this trail entrance sign is also included in all formats of the trail information—audio, print, and online.





Stony Brook Wildlife Sanctuary

## Stop Markers

Along the trail, interpretive stops are indicated by stop markers installed atop posts. These stop markers are printed on anodized aluminum in highly readable large block print and braille lettering. Where appropriate, we also include the phone number for accessing the audio tour by cell phone. These custom fabricated trail markers use materials and engraving methods that maximize safety and comfort for braille readers to touch in all temperatures and weather conditions. Our stop markers were fabricated by a local sign company recommended by Perkins School for the Blind Braille and Talking Book Library. The Perkins staff proofread all drafted braille trail stop markers before they were fabricated.

## Labels

Some interpretive stops are further enhanced with labels (in large, highly readable block print and braille) identifying one or more features located at that stop.

## Other Signs Installed Along Trails

Additional directional or identification signage is sometimes installed to indicate nearby accessible amenities, such as a nature play area, picnic area, or wildlife observation platform.

## PUBLICATIONS

The trail information, interpretive tour, and trail map are printed in multiple formats. All the information is available on our website, [massaudubon.org/accessibility](http://massaudubon.org/accessibility).

Being able to offer program materials in an accessible format for people who are unable to read regular print due to a disability is vital to the success of a program reaching out to the disability community. Below are some guidelines that can help your in-house team to work with the organization producing braille, tactile maps or graphics, braille signage, labels, large print (if you are not doing it in-house), or audio recordings for your projects.

First, determine what formats you believe you will need. Ask your advisory group members, and consider the audience intended as you make decisions about braille or audio formats.

## Braille Booklets

Braille booklets of the trail information and interpretive tour and a tactile map of the trail are available on site for use by visitors. Perkins School for the Blind Braille and Talking Book Library oversaw the production of the braille trail materials. Determining how many copies of braille materials you need will help to guide you on what braille producer to select. Generally, smaller braille production programs such as the Perkins Library are willing to produce fewer copies of a braille document. If you have a project, and you need more than 100 copies, you may be best served with a larger braille production organization such as National Braille Press. Contact information for these two organizations will be provided at the end of this section. If a more detailed national listing of braille producers is needed, you can contact the Perkins Library.

The first thing an organization can do to help with the process of producing braille is to prepare and format designated materials for braille production in a way that will aid the braille producer to expedite the production process using your original source file.

Braille is not a visual medium, it is a tactile reading system. Braille is read by touch, across a line consisting of characters that are made up of various combinations of raised dots within a 6-dot cell. Braille can represent the alphabet, numbers, and short-form word abbreviations. Information in braille is presented in a linear way across the line. For this reason much of the formatting that enhances a print document may be inappropriate in braille formatting.

When preparing a Microsoft Word or RTF (rich text) document for braille production, it is recommended that you produce it with minimal formatting. Formatting a document after the text has been typed is easier than removing formatting for the braille production process.

Save the document to be used for producing the braille materials as “document name for braille.docx.” Documents being emailed for braille production should be sent as attachments and not pasted into the body of an email message. A Word or RTF (rich text) file format document is always preferred.

## Braille Production Guidelines

### Software Program Recommendations

- Microsoft Word
- Excel
- PowerPoint if saved in Outline View as (RTF) file
- PDF files are not generally recommended

The following formatting can be used when preparing braille documents:

- Center headings and subheadings
- Use block paragraph style (one blank line between paragraphs)

The following formatting should not generally be used for braille documents:

- All Caps (may be used for emphasis for a few words only)
- Bold (may be used for emphasis for a few words only)
- Underlining (may be used for emphasis for a few words only)

- Italics (may be used for emphasis for a few words only)
- Right Justify
- Right/Left Justify (Line Fill)
- Borders
- Shading
- Graphics
- Columns

## Large Print Trail Tour Booklets

Feedback from our trail testers and visitors has taught us that it is helpful to provide large print, printer-friendly versions of the booklets for download from your website, in a document format that readers can optimize for font size, ink color, and paper color.

## Large Print Production Guidelines

- Use a simple font, such as Ariel, Verdana, or APH (APH fonts were developed by the American Printing House for the Blind (APH) specifically for low vision readers. APH fonts embody characteristics that have been shown to enhance reading speed, comprehension, and comfort for large print users. It is available for free from APH at [aph.org/products/aphont](http://aph.org/products/aphont).
- Use a font size ranging from 16-20 point for the printed copies. Having a Word or RTF (rich text) file format document available for visitors to access online before their visit, and for visitor services personnel to access at the sites, will allow visitors to customize a printout in their preferred font size and text-background color combination.
- Headings or subheadings can be represented with a slightly larger font size
- The body of the text should be left justified; with indented or centered headings
- Use a blank line between paragraphs rather than indenting
- Avoid decorative or script fonts, (such as Times New Roman), all bold, italics, underline; all uppercase
- Avoid hyphenating text at the end of the line
- Avoid text on top of graphics or watermarks



## Regular Print Trail Tour Booklets

A regular printed booklet, available onsite and online, is designed for high readability with clean designs in large, simple fonts. Printable copies of each regular print trail booklet are available at [massaudubon.org/accessibility](http://massaudubon.org/accessibility).

## Tactile Trail Maps

For each accessible trail, the Perkins School for the Blind Braille and Talking Book Library handled the production of a tactile trail map. These maps were either printed on heavy paper or incorporated into the braille tour books. Tactile maps are not necessarily used by everyone who is blind or visually impaired, just as with sighted people, some like maps and some don't. However, for those who can really gain a perspective of the layout of a trail with a tactile map, they are very much appreciated. Our approach to providing the tactile maps is similar to the braille tour booklets and the audio tour; we want to make the trail information available in multiple formats so that all visitors can experience the trails, using the materials that are most useful to them.

## Production Guidelines

The creation of raised line graphics is a specialized skill requiring simplicity in design. What is needed is a very straightforward, black line drawing. Drawings can be hand-drawn or software can be used. If you use software to generate the drawing, you need to leave enough space to insert numbers, braille or letters along the main path line to represent the path's key features. A key is often used to provide full names of trail elements such as nature center or pond, since there is not enough space on the tactile map to include more than a number, letter or braille character. Water features are usually represented by a filled in oval or circle to show that shape raised in the final map. Benches are usually represented by a rectangle. A wooden board walk or bridge might be represented by railroad track-like lines to show it is different from the main path. Tactile maps can often be bound right into trail guides, but it is also possible to mount tactile maps on a solid backing to share more easily with people or allow them to carry the tactile map more effectively along the path.

## AUDIO TOURS

An audio tour is another way to give visitors a greater appreciation and understanding of the nature trail. An audio tour is useful for all visitors, including those who are visually impaired as well as auditory learners (those who are most comfortable using audio-formatted information). Some visitors may wish to listen to the audio tour prior to their visit, while others may hear it for the first time while navigating the trail.

All Mass Audubon audio tours are available online at [massaudubon.org/accessibility](http://massaudubon.org/accessibility).

## Designing the Audio Tour

The use of sounds and rich, verbal descriptions on the audio tour make the trail experience come alive. Most sites have at least two audio tours highlighting different seasonal features along the trails, and one site has additional interpretation in Spanish and for children. Our goal is to have one or more audio tours available to meet the widest range of visitors' needs, interests, abilities, and ages.

It all starts with a written script, which is almost identical to the content in the printed tour booklets. One difference, of course, is that the audio tours can include the actual sounds only described in the printed tour booklets.

Some questions to consider before designing a script for audio:

- How long should the audio component be, and how long should each stop description be? (Our audio tours generally last 30 to 60 minutes, with each stop generally 1 to 3 minutes long.)
- How many stops will there be? (Our audio tours generally have 10 to 14 stops.)
- What should be included, such as historical background, nature sounds, credits/attribution, and navigational instructions? (Our audio tours include all of these things.)
- Will you wish to include explicit navigational instructions for blind visitors? (We do.)
- How will visitors access the audio, via an audio player supplied by your group, via the

internet, via cell phone, or through some other means?

- Who will record the audio? (We invite a local radio or TV personality to record the primary content and use someone else for the navigational instructions.)
- Will you need more than one script? (Our audio tours often include different seasonal versions.)
- Will you make the audio available in more than one language? (We offer our audio tours in Spanish at some of our locations.)

Our audio tours are available in different ways, depending on the site:

- All audio tours are available online, for listening to before visiting the trail and/or downloading onto one's personal audio player
- All audio tours are available onsite by borrowing a Victor Stream Reader pre-programmed with the tour(s) for that site. Victor Reader Stream is an audio book and music player manufactured by HumanWare ([humanware.com](http://humanware.com)). These units are popular for listeners who have low vision or are blind.
- At some sites, where cellular signals are strong and consistent, a phone number is available for visitors to call and listen to the tour with their own cell phone.
- We are exploring the possibility of having the audio tours available on one or more smartphone apps.

## Recording the Audio Files

Each segment or "stop" should be assigned a two-digit number on the script. These numbers will be used to name the audio files so they can be sorted for listening in the proper order. This will also enable visitors to select specific files they wish to listen to. The recording process will be greatly simplified if you can enlist the help of an experienced local radio or television broadcaster with access to a recording studio.

Each stop or segment should be recorded as a separate file and given a file name corresponding to the stop number (for example, 01.wav, 02.wav, etc.). Initial recordings should be saved as .wav PCM files or in some other uncompressed format to preserve greatest fidelity. These uncompressed audio files should be saved and used any time post-production edits need to be done.

If possible, plan to listen in while the recordings are being made. If you hear a mispronunciation or other error, ask the recordist to re-do that segment. It's always easier to correct problems during production rather than later.

Once the initial recordings are done, you may wish to use a file sharing program such as Dropbox so you and the recordist can easily update and share the files. You can create a folder and share it with anyone who needs access to the audio files for editing or post-production review.

If necessary, good quality recordings can be made on a home computer, as long as you have a quiet environment, a studio-quality microphone, and an audio mixing board, along with an audio editing program such as GoldWave ([goldwave.com](http://goldwave.com)).

## Adding Nature Sounds

Bird and animal sounds are readily available on the internet, but it's important to determine whether the ones you plan to use are protected by copyright; you may need to purchase professionally recorded sound clips. When inserting audio clips into your recordings, be sure to adjust volume levels so the inserted files are at the same level as the content recordings; this can take a bit of practice.

## Final Production of Audio Tours

Once the recordings are done, ask several people to proof them by listening while following the written script. This is a crucial step to ensure that all errors have been found and corrected.

Before this final review, you will probably want to convert the files into a compressed format such



as MP3. This can reduce the files to a tenth of their original size without any noticeable loss of fidelity. Settings of 128 bits per second (BPS) with a sampling rate of 44,100 should suffice. These smaller compressed files are more manageable, especially if they are to be placed on a website.

## **Use of Audio Players**

You may wish to purchase audio players for visitors to use at your site. It is important to find a model that is easy to learn to use and is as accessible as possible for people with disabilities. There are many very small players on the market that are unusable by people who cannot see well or who have physical disabilities that affect their manual dexterity. One very accessible model is the Victor Reader Stream from HumanWare. Whichever player you select should accept a standard SD memory card. You will be able to plug the card into a computer, load the numbered files on it, and then insert it in the player.

## **Putting Your Audio Tour on the Internet**

Your website administrator can put the finished MP3 files on a website. There are good reasons to do this. Interested individuals can listen to and learn from your audio content prior to visiting your site, and those who are prohibited from visiting by poor health or physical challenges can still enjoy the audio files from anywhere in the world, as long as they have access to the web. Some visitors may prefer to download the files from the website onto their own audio players or mobile devices. You may wish to place a single “zip” file containing all of the audio files on your website for convenient download.

## **Making Your Audio Tour Available Via Cell Phone**

There are companies that can make your audio content available via a phone number. Anyone with a cell phone can dial the number while visiting your site and listen to your audio tour while on the trail, and of course the audio tour can be accessed by phone from anywhere. However, before you make this option available, you will want to check to be sure cell phone service is accessible from your

location. One cell phone tour service provider to consider is Spatial Adventures ([spatialadventures.com](http://spatialadventures.com)).

## **Post-Production Updates**

Nature is not static, by any measure. Trees fall. Nests and burrows are abandoned. Beavers move into and out of an area, dramatically altering wetlands. So, eventually you may need to update your audio content. Begin by updating the uncompressed files you saved from the initial recordings. Then convert those to MP3 and make the new compressed files available to your web content manager and everyone else who will need them. The files will need to be replaced in any players in use at your site, and if you are using a cell phone tour provider, you'll need to send them a set of the updated files.

## ONLINE RESOURCES AND ORGANIZATIONAL INFORMATION

Through participating in accessibility and inclusion learning networks and training workshops, we have learned about the importance of providing “know before you go” information and resources to potential visitors.

Maps, audio tours, and accessibility information are included on our website, as many trail testers told us that they found it helpful to have this information available prior to a visit. Mass Audubon’s website has an “accessibility” tab that leads to all of our accessibility information and resources. The website includes information on each of our accessible trails and Mass Audubon’s statewide accessibility resources. Visit [massaudubon.org/accessibility](https://massaudubon.org/accessibility). The audio tours are available to listen to online, or they can be downloaded to an audio player. The trail maps and trail booklets may also be downloaded for viewing. Online visitors will find information about the trail design and features, wildlife sanctuary hours of operation, and more.

Mass Audubon has also incorporated accessibility information into updated versions of several statewide resources, including our *Places to Explore* printed sanctuary guide, which prominently features accessibility information.

## SUMMARY

### Creating Trail Experiences and Trail Materials

- ☐ With the help of your accessibility partners and testers, plan and implement any necessary trail improvements for safety, navigation, seating, and more
- ☐ Decide what trail features, components, and experiences you will highlight
- ☐ Develop a plan for what trail materials you will produce for visitors to use, what formats these materials will include, and the different ways visitors will be able to access these materials before, during, and after their visit
- ☐ Plan the signage and have it designed and fabricated for text maximum readability and braille
- ☐ Have testers and partners review, test, and proofread all planned trail materials before things are finalized, fabricated, and installed
- ☐ Develop the “know before you go” materials that will be available for prospective visitors
- ☐ Develop the customer service capacity and comfort of each site’s staff and volunteers to offer the trail materials, help visitors as needed, use the devices, and be generally very familiar with the materials and experiences available on the trail





Top left: Broadmoor Wildlife Sanctuary

Top right: Boston Nature Center

Bottom: Broad Meadow Brook Conservation Center and Wildlife Sanctuary

# GUIDELINES FOR OPERATING ALL PERSONS TRAILS

## MAINTENANCE/UPKEEP OF TRAIL AND TRAIL MATERIALS

Mass Audubon's All Persons Trails all require seasonal upkeep and maintenance:

- Trim vegetation, especially removing poison ivy, that is encroaching along the edges of the trail or guide ropes
- Repair or replace any trail components that have been damaged or lost, including loose boardwalk boards, railings, seating, and sign posts
- Grade trail surfacing as needed
- Remove any debris that has been deposited along the trail

The trail materials need to be maintained as well:

- Trail booklets (regular print, large print, braille) need to be updated and/or reprinted as needed
- Online information must be kept current, especially if there are seasonal trail closings or cautionary messages
- Audio players should be kept in good working order, with fully charged batteries
- Update equipment as technology improves

## ACCESSIBILITY AND INCLUSIVITY TRAINING AND CUSTOMER SERVICE

Our team of accessibility consultants helped develop our staff and volunteer accessibility training program so we can help all visitors, and potential visitors, have access, feel welcome, and be safe and comfortable at our wildlife sanctuaries. We have three different training modules, all designed to:

- Get staff members and volunteers more comfortable with welcoming and including visitors with a full range of physical, sensory, and brain-based functional abilities
- Familiarize participants with Mass Audubon's statewide accessibility efforts and accessible trails
- Introduce regulatory information, state and

federal accessibility rights, regulations, and resources

- Review etiquette and expected customer service for greeting and assisting individuals with disabilities in person and over the phone
- Introduce the adaptive equipment and new information available at each nature center
- Explain accessibility-related policies and statements such as OPDMD (other power-driven mobility devices, other than wheelchairs) and Mass Audubon's statement on service animals

### Accessibility Training Provided Onsite Before a Trail Opening

Before each trail opening, sanctuary staff members and volunteers participate in a 2–3 hour accessibility training that includes etiquette, regulatory information, and customer service. We include role play exercises and have at least one of the trainers be a person with disabilities.

### Accessibility Training Refreshers

Our wildlife sanctuaries conduct ongoing training for staff and volunteers. One sanctuary uses this training refresher workshop outline:

1. Overview of what it means to be an inclusive and accessible organization
  - a. Mass Audubon initiatives
  - b. Initiatives at our wildlife sanctuary
2. Policy and Procedures
  - a. Mass Audubon policies
  - b. Wildlife sanctuary policies, admission, and programs
  - c. Etiquette (disability awareness)
3. Accessible resources and tools available
  - a. Presenting accessible options and how to use them (accessible trails, audio tour, braille guides, seat canes, binoculars)
4. Questions and Comments

## Full-day accessibility workshop

In 2016, as Mass Audubon was preparing to open our 12th All Persons Trail, we offered a daylong accessibility workshop, and asked each Mass Audubon nature center and department to send at least one representative. Here's an outline of what we did during that workshop for the 56 participants.

### Connecting ALL People with Nature Workshop

Date: Thursday, February 25, 2016 (storm date: March 3)

Time: 9:30 am – 4:00 pm

Location: Mass Audubon's Boston Nature Center in Mattapan

Presenters: Lucy Gertz – Mass Audubon Statewide Education Projects Manager  
Stu Weinreb – Mass Audubon Director of Capital Assets and Planning  
Erin Pitkin – Mass Audubon Drumlin Farm Special Education Coordinator  
Kris Scopinich – Mass Audubon Director of Education  
Jerry Berrier – Perkins School for the Blind Access Technology Consultant  
Stacy Hart – New England ADA Center ADA Information and Training Specialist,

#### Schedule:

9:30am	Coffee and morning snacks
9:45am	Introduction and Ice Breaker – ADA Quiz
10:00am	Sharing our accessibility experiences and challenges
10:45am	Overview of Mass Audubon accessibility/inclusion efforts <ul style="list-style-type: none"><li>• Facilities and trails (Stu)</li><li>• Developing universally designed trail experiences (Lucy)</li><li>• Inclusivity in MAS's Strategic Plan 2020 and Education Plan (Kris)</li><li>• 2015 MCC UP (Massachusetts Cultural Council UP Inclusive Design Initiative) goals and projects, adaptive programs, tools (Lucy and Erin)</li><li>• A professional and personal perspective on Mass Audubon's inclusion work (Jerry)</li></ul>
12:15pm	Lunch
1:00pm	ADA Regulations/Accessibility Etiquette/Customer Service (Stacy and Jerry) Scenarios and practice exercises (Stacy and Jerry)
3:00pm	Small group discussions – We will divide into small groups based on our roles: <ul style="list-style-type: none"><li>• Greeting visitors/providing information in person or by phone</li><li>• Working with volunteers</li><li>• Written/online communications</li><li>• Preparing/maintaining visitor areas and resources (trails, exhibit spaces, etc.)</li><li>• Coordinating and/or leading education activities and events</li></ul>
3:30 pm	Next steps <ul style="list-style-type: none"><li>• Facilities, All Persons Trails work plan (Stu and Lucy)</li><li>• Education directions (Kris, Erin, Lucy)</li></ul>



## OUTREACH

Outreach efforts can be most effective when incorporated into every stage of the development and operation of an accessible trail. We incorporate our outreach efforts into four stages of trail planning and operation. We have realized how important it is to stay in contact with everyone interested in the trails and anyone who has supported the trail in any way, at every stage of development.

### Planning the Trail and Developing the Trail Materials

As previously described on page 19, we reach out to local individuals and groups, representing people who require various accessibility accommodations, to help develop the trail experiences and test the drafted trail materials. The resource professionals and testers also help with outreach, inviting others to be involved in the planning stage and to attend the trail opening event. We encourage and support others to visit the trail after it opens.

### Preparing for the Trail Opening Event

When an All Persons Trail is ready to open, we usually have a trail opening event. Everyone involved with the trail planning is invited to the opening and encouraged to bring guests. Even interested individuals who could not participate in a scheduled testing session are invited to the opening and to other special events associated with the trail. Invite state and local officials, funders, internal organizational leaders, and representatives from other stakeholder groups and resource agencies. When planning a trail opening event, outreach and media go hand-in-hand. Contact local newspapers and send a press release to be included in their calendars in order to let people know about the opening. Reach out to local media outlets, requesting that they send a reporter/photographer to cover the event. Accessibility resource professionals can publicize the trail opening to all their constituents.

### Operating the Trail

For ongoing publicity, request to be included in the electronic notices and newsletters of all the organizations who reach out to your targeted audience. Create a database with names, addresses,

emails and numbers for all of the above. Be the guest speaker at small monthly meetings as well as larger conferences. Invite a reporter or editor of one or more of the papers, television stations, or radio stations to one of your trail programs and make sure to have a press release to hand them with the 'story' you want to get across. Finally, work with local businesses, funders, schools, friends groups, scouts, and volunteers to help with trail publicity and upkeep.

### Evaluating and Improving the Trail and Trail Materials

Trail visitors and the resource professionals who support them can play an important role as trail evaluators. Invite all trail users and supporters to provide feedback whenever they visit the trail or use the trail materials. Setting up an All Persons Trail, and effectively engaging an inclusive audience, is not a one-time effort. You can continue to refine your trail and trail materials with the honest and constructive feedback of those who use the trail.

### General Approaches for Effective Outreach

As with any effective outreach, the goal is to inform targeted segments of the population about your facilities' offerings and invite them to visit. Sharing information about your accessible trail, the wildlife viewing structures, specialized gardens, and other accessible amenities is the first step to attracting visitors to your site.

Successfully connecting with local people with all types of disabilities isn't always an easy undertaking. It is extremely helpful to contact organizations for the blind or visually impaired, and the deaf or hard of hearing. There are specific community email distribution lists for people who are blind or deaf to share information and resources on a regular basis. If you can connect into the network with a member of the community to post your messages, you will have much greater success in spreading the word about your programs and activities.

The Perkins Library can help you connect in your area to the braille and talking book library program to reach more people through their newsletters

or social media. Check out the websites for the American Council of the Blind ([acb.org](http://acb.org)) and the National Federation of the Blind ([nfb.org](http://nfb.org)) for contacts in your state.

National Braille Press  
88 St. Stephen Street  
Boston, MA 02115  
617-266-6160  
[nbp.org](http://nbp.org)

Perkins Library  
175 North Beacon Street  
Watertown, MA 02472  
617-972-7240  
[library@perkins.org](mailto:library@perkins.org)  
[perkinslibrary.org](http://perkinslibrary.org)

Local commissions on disability, regional offices of the state rehabilitation agency, and the commission for the blind can be very helpful at spreading the word and connecting you with key consumer advocates.

## **Internal and External Outreach**

Through numerous presentations and written articles, we have proudly shared with our members, sanctuary visitors, Board of Directors, website visitors, and Mass Audubon colleagues what we have learned and accomplished, and how we plan to continue to grow in our capacity to provide accessible outdoor experiences for all persons. Thanks to outreach efforts and publicity, Mass Audubon now regularly receives requests for information and advice from other land-based organizations interested in designing and building accessible interpreted nature trails. We happily oblige, as do our accessibility partners and consultants who also field many inquiries.

## **Media Outreach Resources**

### **National Newspapers:**

[onlinenewspapers.com/usstate](http://onlinenewspapers.com/usstate)  
[wikipedia.org/wiki/List\\_of\\_newspapers\\_in\\_the\\_United\\_States](http://wikipedia.org/wiki/List_of_newspapers_in_the_United_States)

### **T.V., Newspaper AND Social Media Contacts:**

[usnpl.com/manews.php](http://usnpl.com/manews.php)

### **National Federation for The Blind—News/ Recreation**

[nfb.org/participating-newspapers](http://nfb.org/participating-newspapers)  
[nfb.org/recreation](http://nfb.org/recreation)

### **National Veteran's Offices**

[va.gov/directory/guide/vetcenter](http://va.gov/directory/guide/vetcenter)

### **National [Statewide] Independent Living Facilities**

[ilru.org/projects/silc-net/silc-directory](http://ilru.org/projects/silc-net/silc-directory)

### **National [local] Independent Living Centers**

[ilru.org/projects/cil-net/cil-center-and-association-directory](http://ilru.org/projects/cil-net/cil-center-and-association-directory)



## MEASURING IMPACT, ASSESSING EFFECTIVENESS, ONGOING REFINEMENTS

When we begin planning each Mass Audubon universally designed All Persons Trail, we reach out for help from resource professionals and from individuals who personally need accessibility accommodations. Having these resourceful individuals work collaboratively with each site team has proven to be a crucial process of interplay between those who know how to reach and engage the widest possible audience and those most familiar with the sites. This interplay resulted in the creation of better trails, obviously, but more importantly, the site teams developed stronger awareness and connections with a broader range of people who can visit the trails and invite others to experience them. As a result of this inclusive planning process, the individuals working and volunteering at the sites became advocates for their own trails, and the visitors who use them.

In many ways, the opening of an All Persons Trail is simply the start of another phase of planning and evaluation. For each All Persons Trail opened, we continually monitor visitation, including the use of accessible materials and website traffic, and assess the effectiveness of our materials and customer service. As expected, since opening these trails, we have seen increased visitation by individuals, families, and groups with physical and cognitive challenges. One trail has been heavily used by a neighboring faith-based senior center whose members make

daily visits to the half-mile trail for fresh air, exercise, and spiritual reflection. This increased visitation gives us great opportunities to connect more people to nature, and to invite more trail visitors to provide input on how these trail experiences are working for them.

Having these trails and other accessible areas has inspired our site teams to develop new accessible educational experiences, as well as incorporate new understandings about more inclusive approaches to all programs. Several of our nature centers—those with accessible trails, and even those without them but with accessible nature centers, picnic areas, and play areas—currently provide programs for more diverse audiences, including “Birding by Ear” for local associations of the blind; “Birding by Van” for birdwatchers who are less mobile; school and Scout programs that often include individuals with physical disabilities; and tours and educational programs for groups with special needs. Our educators and visitor services personnel have opportunities for accessibility trainings, and updated resources are provided when available. Not all of our outdoor programs can be fully accessible, but many can be made more accessible with minor adjustments and a change in the leader’s approach. We do our best to advertise those programs that are more accessible.

Visitor feedback continues to be extremely valuable to us, as we continually work to make these trail experiences as inclusive, accessible, and effective as possible. On the 12 All Persons Trails at Mass Audubon sanctuaries (eight of these completed with Institute of Museum and Library Services funding, four with other sources of funding), visitation is



being monitored and feedback gathered from trail users and evaluated. Feedback is collected by prompts provided at the end of the cell phone tour, personal interviews, a written questionnaire, and an online survey.

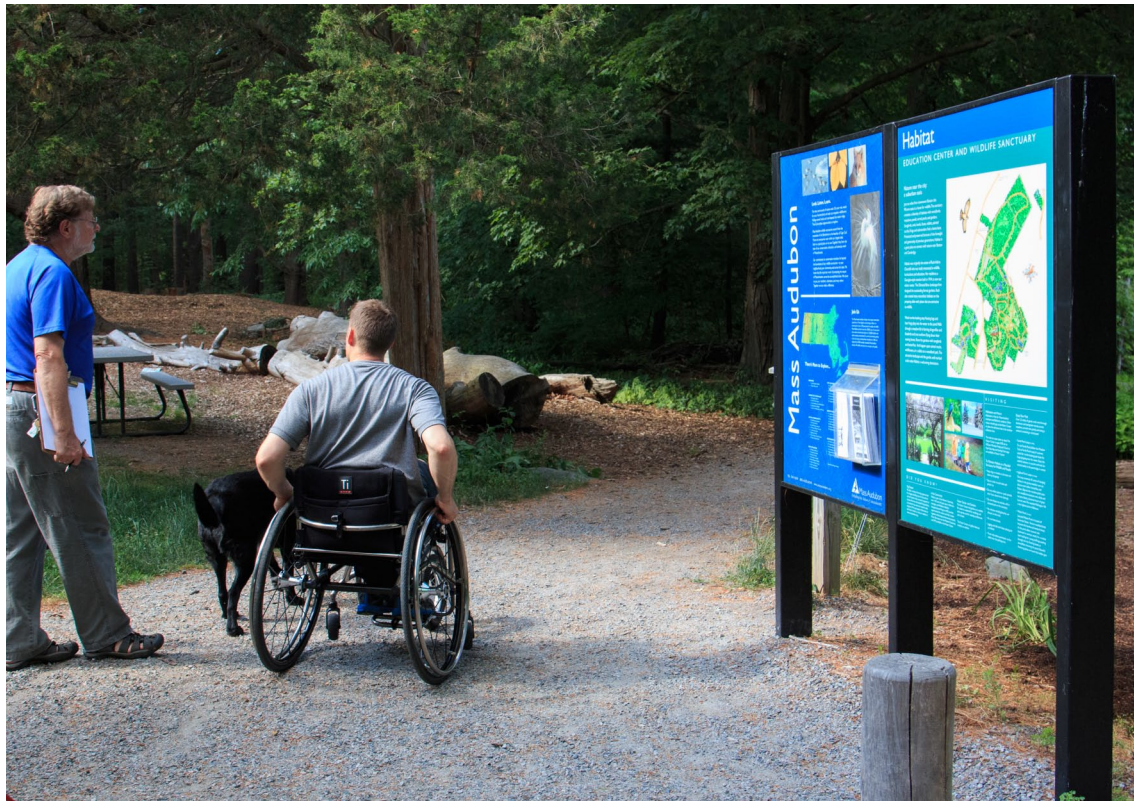
We are making improvements where needed based on user feedback. For example, audio tour usage has been strengthened by adding signage with phone numbers and having Victor Reader Stream audio players available for loan at all twelve sites. Visitor feedback has informed us that these devices would be more user-friendly if they came with hands-free straps and louder speakers, so we are planning to make those improvements. Visitor services staff at several of the sites have requested a brochure/materials rack to make such items more readily available to visitors, so we are currently designing one. We will also continue to provide accessibility refreshers and training workshops around the state. We conducted three of these workshops, one in each region of the state, in 2014-15, and in 2016 we conducted a daylong workshop attended by a representative from every Mass Audubon field site and operational department. We have continued to “raise the bar” for accessibility at all Mass Audubon sites as staff and volunteers become more aware of this project, its successes, and its rewards.

## SUMMARY

### Guidelines for Operating All Persons Trails

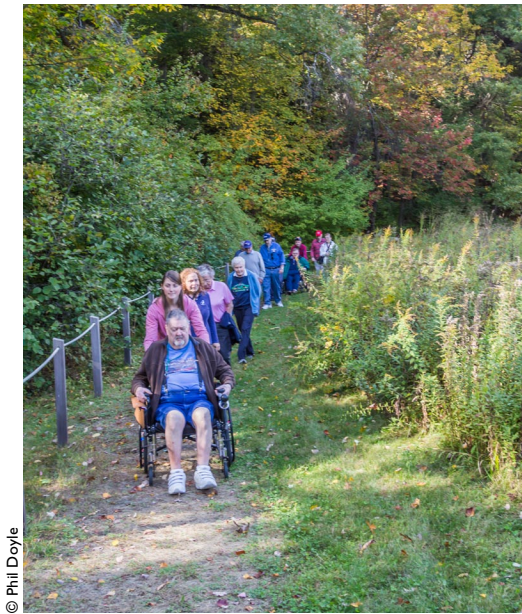
- ☐ Incorporate outreach into every stage of planning and operation
- ☐ Find opportunities to publicize the trail and activities associated with it on your website, through presentations and at events, and with the help of partners
- ☐ Keep the trails well-maintained for visitor safety and enjoyment
- ☐ Keep the trail materials in good working order
- ☐ Make sure staff and volunteers keep receiving accessibility training and updates; make sure to learn from any situations that resulted in less-than-ideal customer service
- ☐ Invite and incorporate ongoing user feedback to continually improve the trail
- ☐ Get the word out through local media, social media, newsletters, emails and mailing lists
- ☐ Invite everyone who has expressed interest, participated in any way, and been supportive
- ☐ Accept invitations for speaking engagements about the trail from interested local groups. Contact local independent living agencies, disability groups, state disability commissions, or regional ADA offices. Presenting what you have to offer to resource professionals, who can share your information with their constituents, is a great way to reach a wider audience.
- ☐ Use your organization’s website to provide trail information, stories, events, and highlights
- ☐ Ask supportive organizations and collaborative partners to post information in their newsletters, on their websites, and in their other informational outlets

Habitat Education  
Center & Wildlife  
Sanctuary

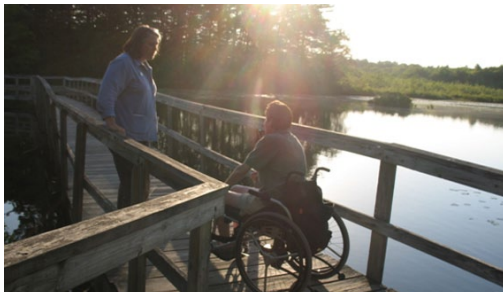


# REFLECTIONS ON BECOMING A MORE INCLUSIVE ORGANIZATION





© Phil Doyle



Top Left: Arcadia Wildlife Sanctuary Sensory Trail. Top and bottom right: Habitat Education Center & Wildlife Sanctuary.  
Bottom left: Stony Brook Wildlife Sanctuary

## REALITIES/CHALLENGES OF MAKING THIS CULTURAL SHIFT

Mass Audubon's ongoing expansion of All Persons Trails directly addresses a key goal and action of our Strategic Plan 2020: "Connect people and nature for the benefit of both—Advance universal accessibility at our sites, ensuring that our nature centers are accessible and that all staffed sanctuaries will have universally accessible trails."

The trails reflect our organization's strategic goal to create more inclusive outdoor experiences for all people and develop stronger connections to nature, especially for individuals who have not traditionally had independent access to natural areas and interpretive experiences. Our long-range strategic goals are to engage more people in protecting the nature of their communities and to strengthen the relationship that all people have with the natural

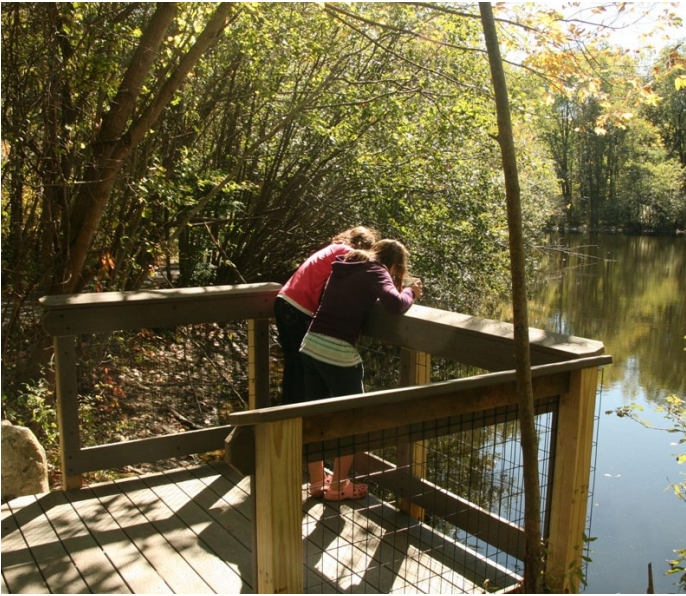
world through outdoor experiences, all toward building a conservation ethic.

This cultural shift requires constant care and handling. Every visitor to a sanctuary with an All Persons Trail should receive the best customer service possible from a visitor services staff member or volunteer who has attended our trainings. He or she is aware of the regulatory information and our etiquette expectations and knows there is a notebook nearby with answers to the most common accessibility questions and challenges that might come up. We try to learn from any "accessibility bloopers" that occur. We can reflect on them and use them as opportunities for developing new understandings and insights. Any such challenge that was not handled properly the first time is widely offset by many great experiences and much good feedback we receive about our trails and our sincere and continuous organizational effort to be more accessible and inclusive.



## STORIES OF IMPACT

Through the ingenuity of outdoor education colleagues, there are many adaptive outdoor recreational programs available for those who want to ski, sail, skate, hike a mountain, paddle, or bike. These programs are successful and crucially important for physically disabled individuals who want an active lifestyle. But there are many who want another level of outdoor activity, such as to have a quiet stroll on a woodland trail, visit the edge of a wetland and experience it with several of their senses, observe wildlife and learn about natural history, and most important, spend time alone in natural settings and feel welcomed, safe, and comfortable.



Habitat Education Center & Wildlife Sanctuary



Attleboro Springs Wildlife Sanctuary



Broad Meadow Brook Conservation Center & Wildlife Sanctuary

At Attleboro Springs Wildlife Sanctuary in Attleboro, we are pleased that a group of local senior citizens has “adopted” the trail, and they use it regularly for exercise and spiritual reflection time.

Arcadia Wildlife Sanctuary’s Sensory Trail in Easthampton is also heavily used by older adults, among others, many with mobility challenges. A local independent living agency will often drop off some clients at Arcadia’s visitor center, confident that they will safely and comfortably be able to interact with visitor service personnel, visit the trail for an hour, and then be ready to be picked up and taken back to the independent living center.

At Broad Meadow Brook Wildlife Sanctuary in Worcester, the Sensory Trail is very popular with visitors. After the trail opened in 2012, sanctuary staff received some very helpful feedback from a trail visitor using a wheelchair, reinforcing our awareness of the priority of maintenance of trail surfaces. Since then, we have improved the mixture of surfacing material, lowering the gravel-to-stone dust ratio to make the surface firmer. This visitor has returned to Broad Meadow Brook to continue to provide helpful input.





Wellfleet Bay Wildlife Sanctuary

At Wellfleet Bay Wildlife Sanctuary on Cape Cod, a large school group arrived for a field trip on a spring day. Fifty energetic sixth-graders tumbled out of the school bus, including one student in a wheelchair. Off they all went together, down the accessible trail, to explore the tidal flats, marshes, and freshwater habitats. A Wellfleet Bay staff member asked the classroom teacher what the student in the wheelchair would have done if Wellfleet didn't have the accessible trail. She replied, "He would have stayed behind in the nature center." This response made us realize the essential importance of creating these trails—and these accessible experiences—so that each individual who visits with a class, family, or other group can enjoy them in a way that is seamless, requiring minimal or no additional special arrangements or logistics.



Blue Hills Trailside Museum

When planning the Sensory Trail at Blue Hills Trailside Museum in Milton, museum staff members were very concerned about how the close presence of service animals might impact the wildlife residing in the exhibit enclosures. To address this concern, one volunteer tester, who is also a service animal awareness advocate and trainer, generously returned and spent an afternoon in the exhibit area demonstrating to the staff how his well-trained service dog would behave near the enclosures.



Blue Hills Trailside Museum

On spring, summer, and fall weekend days, several hundred visitors walk the grounds of the Blue Hills Trailside Museum, enjoying the exhibits on the habitats and wildlife of the adjacent, state-owned Blue Hills Reservation. Visitation by individuals and groups requiring accessibility accommodations usually averages three individuals/groups per week. In addition, the many visitors pushing strollers are very grateful for the accessible pathways. The guide rope, braille signage, and booklets have also provided an unexpected and positive benefit in opening a dialogue among children, especially during visits from school groups, regarding using a variety of senses and also understanding the importance of universal accessibility. Local students working on projects involving universal access have borrowed the materials on more than one occasion to present to their classes.





Pleasant Valley Wildlife Sanctuary

The trail at Pleasant Valley Wildlife Sanctuary in Lenox was originally constructed in 2004, and over the years received light visitation. It was hoped that enhancing the trail with accessible experiences and materials would increase usage. Since the September 2013 opening of the enhanced trail, several different parties have come to Pleasant Valley specifically to experience it. Most used mobility devices and commented that they appreciated the firm, reliable, graded trail surface that allows them to travel the 1,700-foot trail and access the scenic overview at Pike's Pond. Occasionally, groups visit from the Berkshire County Arc and from Hillcrest Educational Centers. A solo visitor to the trail was recuperating from serious back surgery; she knew about the trail and was eager to get some accessible, therapeutic exercise. The trail is now routinely used by older adults and easygoing walkers who very much appreciate the sure footing and the scenic destination. The sanctuary's region includes several assisted living centers, and some are now transporting residents to Pleasant Valley. One assisted living center is currently constructing a much larger facility, and our staff plan to reach out to them and welcome their new residents to enjoy the trail.



Drumlin Farm Wildlife Sanctuary

To complement the Sensory Trail that opened in the fall of 2013, Drumlin Farm in Lincoln has developed several accessible programs and resources. With grant funding from a regional foundation, Drumlin Farm hired a Special Education Coordinator in a new part-time position. With the support of another local funder, Drumlin Farm ran a series of seven free, accessible explorations for families with children who have special needs. The response to the first two dates was extremely gratifying, with 69 participants with a variety of physical, intellectual, and emotional disabilities exploring the farm, meeting the animals, and trying new experiences. One caregiver expressed her joy at seeing her student who is visually impaired grooming a pony after she initially hesitated to even get close to the animal. A mother commented on how her son with a social anxiety disorder remained focused for the entire two-hour program, as compared to a typical visit without this customized attention where he would have lost interest after 45 minutes at most.



Drumlin Farm Wildlife Sanctuary





Drumlin Farm Wildlife Sanctuary



Habitat Education Center & Wildlife Sanctuary



Arcadia Wildlife Sanctuary

We look forward to presenting future events where we will offer American Sign Language (ASL) interpretation and close the farm to the public to provide a quieter experience for those who need it. We have also engaged a professional horticultural therapist to offer garden learning activities and crafts in our Learning Garden during these events. Having the Sensory Trails onsite has helped the Drumlin Farm staff to focus their attention on providing accessible experiences for all.

On the All Persons Trail at Habitat Education Center and Wildlife Sanctuary in Belmont, a staff member happened upon a family in the Pine Grove. The family spanned four generations: there was a toddler in a stroller, her parents, her grandparents, and a great grandmother. They were all smiling so broadly that the staff member remarked on their cheerfulness. The matriarch explained that it was the first time they had all been able to take a walk in the woods together. She went on to say that it had been twenty years since she had been to Habitat's Turtle Pond, because before the new trail was built there had been too many roots and rocks for her to maneuver. They all had wonderful past experiences at Habitat to share and the staff member left them as they added another memorable adventure to the list.

Our accessibility consultant has spoken eloquently about how, with our All Persons Trails, someone could drop him off at a sanctuary and he could enjoy some time alone in nature, guiding himself on his own—a rare and highly valued experience for him. Other testers, family members, and organizations have corroborated this need. In addition, thanks to the high visibility of these trails after they opened, we receive several calls each month from other organizations, both local and from around the country, wanting detailed information and advice on how to create similar trails at their sites. These have included land trusts, town conservation agents, schools, private planning consultants, and wildlife refuges.

Through our work with individuals and agencies that bring the perspectives of people who need accessibility accommodations related to physical,





Habitat Education Center & Wildlife Sanctuary

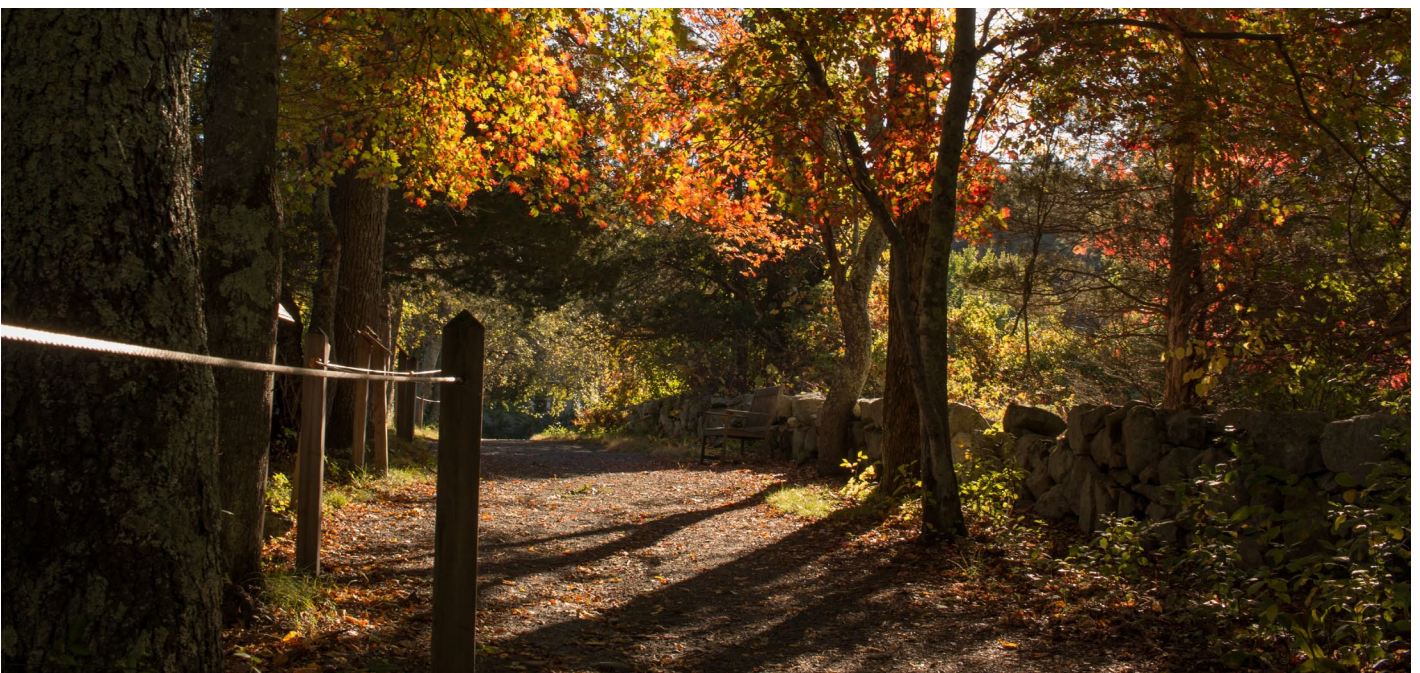
sensory, and brain-based challenges, we have learned how few opportunities there are for these individuals to spend time alone in nature and learn more about the natural world. As more accessible, interpreted nature experiences are made available, more people will have opportunities to spend time independently experiencing natural settings, developing a stronger connection with the natural world, and enjoying the physical and mental health benefits that come with spending time being active outdoors.



Habitat Education Center & Wildlife Sanctuary

Our accessibility consultant, who works at Perkins School, noted that it was very difficult for people with vision impairments to get enough exercise and outdoor activity, and that our project fostered this ability in the context of a learning experience. We sincerely hope these guidelines will enable us to assist other organizations wanting to design such outdoor interpretive experiences, and ultimately, more individuals will have accessible outdoor experiences available to them.

Lastly, “The Joys of Walking in the Woods...Alone” is a story from Mass Audubon’s member newsletter. We feel it provides a great summary for our All Persons Trails and the impact they have had on those who enjoy them [massaudubon.org/accessibility](https://massaudubon.org/accessibility).



Stony Brook Wildlife Sanctuary

# REFERENCES AND RESOURCES

## References and Resources for Trail Design and Construction

### Mass Audubon Procedures and Statements

- Procedure for the Use of Power-Driven Mobility Devices on  
Mass Audubon Sanctuaries
- Mass Audubon Statement on Service Animals

### Massachusetts Department of Conservation and Recreation Resources

- DCR Trail Policy and Program Mission
- DCR Summary of Guidelines for Accessible Trails
- DCR Guidelines for Accommodating Visitors with Accessibility Needs
- DCR Accessibility Guidelines

## US Forest Service Accessibility Guidelines 2013

## Considerations for Visual Accessibility of Text

### Mass Audubon Accessible Trails Resource Materials

- Evaluation Plan for 2010-2013
- Questionnaire for Accessible Trails Feedback



## References and Resources for Trail Design and Construction

*United States Access Board, Guidelines and Standards for Federal Outdoor Developed Areas*

<https://www.access-board.gov/guidelines-and-standards/recreation-facilities/outdoor-developed-areas>

*United States Access Board, Guidelines and Standards for Recreation Areas*

<https://www.access-board.gov/guidelines-and-standards/recreation-facilities>

*United States Access Board, ABA Guidelines for Buildings and Sites*

[access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/aba-standards](https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/aba-standards)

*Department of Justice, 2010 ADA Standards for Accessible Design*

[ada.gov/regs2010/2010ADASTandards/2010ADASTandards.htm](https://www.ada.gov/regs2010/2010ADASTandards/2010ADASTandards.htm)

*United States Forest Service, Accessibility Guidebook for Outdoor Recreation and Trails*

[fs.fed.us/recreation/programs/accessibility/pubs/htmlpubs/html2232806/index.htm](https://www.fs.fed.us/recreation/programs/accessibility/pubs/htmlpubs/html2232806/index.htm)

*National Park Service, All In! Accessibility in the National Park Service*

[nps.gov/aboutus/upload/All\\_In\\_Accessibility\\_in\\_the\\_NPS\\_2015-2020\\_FINAL.pdf](https://www.nps.gov/aboutus/upload/All_In_Accessibility_in_the_NPS_2015-2020_FINAL.pdf)

*National Trails Training Partnership*

[americantrails.org/resources/accessible/](https://www.americantrails.org/resources/accessible/)

*USDA Forest Service, Trail Construction and Maintenance Notebook*

Includes excellent descriptions and diagrams of various trail construction and maintenance techniques including tread maintenance, grade dips, switchbacks, and bridges.

[www.fhwa.dot.gov/environment/recreational\\_trails/publications/fs\\_publications/00232839/index.cfm](https://www.fhwa.dot.gov/environment/recreational_trails/publications/fs_publications/00232839/index.cfm)

*Appalachian Mountain Club, The Complete Guide to Trail Building and Maintenance*, 3rd Edition, by Carl Demrow and David Salisbury.

Includes the essentials for creating environmentally sound trails: how to plan, design, build, and maintain trails; protective gear; choice of tools for each job; building ski trails, bridges, stiles, and ladders. Updated techniques focus on stonework, drainage, and erosion control, and working with private landowners. Photos and illustrations are also included.

[amcstore.outdoors.org/amcs-complete-guide-to-trail-building-and-maintenance](https://amcstore.outdoors.org/amcs-complete-guide-to-trail-building-and-maintenance)

*Appalachian Trail Conservancy, A.T. Design, Construction, and Maintenance*,

2nd Edition, by William Birchard, Jr., Robert D. Proudman, and the Regional Staff of the Appalachian Trail Conservancy.

The definitive handbook on trail work, from landscape values to the nitty-gritty of moving rock.

[appalachiantrail.org/home/volunteer/toolkit-for-trail-clubs/reference-materials](https://appalachiantrail.org/home/volunteer/toolkit-for-trail-clubs/reference-materials)

Student Conservation Association, *Lightly On The Land: The SCA Trail Building and Maintenance Manual, 2nd Edition*, by Bob Birkby.

For half a century, the Student Conservation Association (SCA) has inspired people of all ages to take part in projects that enhance the environment. In settings from city parks to backcountry wilderness, the practical skills presented in its pioneering handbook have been tested in the field by volunteer and professional work crews throughout the nation. Their input enriches every chapter of the new edition with fresh approaches, new ideas, and modern applications of traditional skills.

[mountaineers.org/shop/books/lightly-on-the-land-the-sca-trail-building-and-maintenance-manual-2nd-edition](http://mountaineers.org/shop/books/lightly-on-the-land-the-sca-trail-building-and-maintenance-manual-2nd-edition)

Minnesota Department of Natural Resources, *Trail Planning, Design, and Development Guidelines*

Provides guidelines for developing sustainable motorized and nonmotorized trails. Extensive attention is given to developing trails that are physically, ecologically, and economically sustainable. A newly developed trail classification system is described to enhance consistency in how different types of trails are planned and designed. The principles of trail design emphasize the art of designing trails to make them more visually appealing and enjoyable. Technical design guidelines for various types of trails are also extensively considered in the manual. Downloads are available at no cost for noncommercial or educational purposes. Call the division of Parks and Trails toll free 1-888-MINNDNR for more information. The manual also may be purchased through the Minnesota DNR bookstore:

[http://dnr.state.mn.us/publications/trails\\_waterways/index.html](http://dnr.state.mn.us/publications/trails_waterways/index.html)

USDA Forest Service, *Accessibility Guidebook for Outdoor Recreation and Trails*

Intended to help users apply the Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) and Forest Service Trail Accessibility Guidelines (FSTAG).

[fs.fed.us/recreation/programs/accessibility/htmlpubs/htm06232801/index.htm](http://fs.fed.us/recreation/programs/accessibility/htmlpubs/htm06232801/index.htm)

University of Minnesota, *Trail Design for Small Properties*

Provides simple, inexpensive solutions for designing, building, and maintaining sustainable trails—trails for hiking, horseback riding, bicycling, cross-country skiing, snowmobiling, off-highway motorcycles (OHMs), and all-terrain vehicles (ATVs).

[conservancy.umn.edu/bitstream/handle/11299/48335/08425.pdf?sequence=1&isAllowed=y](http://conservancy.umn.edu/bitstream/handle/11299/48335/08425.pdf?sequence=1&isAllowed=y)

University of Minnesota, *Recreational Trail Design and Construction Manual*

A guide for private woodland owners, organizations, and businesses (including nature centers, youth groups, schools, conservation clubs, and resorts) that are interested in designing and constructing trails. It describes step-by-step construction methods, ways to handle trail obstacles, and recommended standards for the most common types of trails.

[transportation.wv.gov/highways/programplanning/planning/grant\\_administration/wvtrails/Pages/manuals.aspx](http://transportation.wv.gov/highways/programplanning/planning/grant_administration/wvtrails/Pages/manuals.aspx)

American Trails, Resource Library on Trails Design and Construction

[americantrails.org/resources/trailbuilding/index.html](http://americantrails.org/resources/trailbuilding/index.html)



International Mountain Bike Association,

*Trail Solutions: IMBA's Guide to Building Sweet Singletrack*

This book combines trailbuilding techniques with proven fundamentals in a colorful, easy-to-read format. It expands greatly on IMBA's popular 2001 handbook, *Building Better Trails*, and breaks new ground by providing detailed advice on banked turns, rock armoring, mechanized tools, freeriding, downhill, risk management, and other pioneering techniques. The book is divided into eight sections that follow the trailbuilding process from beginning to end. Readers will be guided through the essential steps of trail planning, design, tool selection, construction, and maintenance.

[imba.com/catalog/book-trail-solutions](http://imba.com/catalog/book-trail-solutions)

*Natural Surface Trails by Design: Physical and Human Design Essentials of Sustainable, Enjoyable Trails*,  
by Troy Scott Parker.

This first book in a series captures much of the detailed knowledge of skilled trail designers. It presents eleven generative concepts as the foundation for a concise process that explains, relates, and predicts what actually happens on all natural surface trails. The concepts cover the essential physical and human forces and relationships that govern trails—how we perceive nature, how trails make us feel, how trail use changes trails, how soils and trail materials behave, and how water, drainage, and erosion act.

<http://www.natureshape.com/pubs/nstbd.html>



## **MASS AUDUBON PROCEDURES AND STATEMENTS**

**Procedure for the Use of Power-Driven Mobility  
Devices on Mass Audubon Sanctuaries**

**Mass Audubon Statement on Service Animals**





## **Procedure for the Use of Power-Driven Mobility Devices on Mass Audubon Sanctuaries<sup>1</sup>**

September 17, 2012

### **Background**

As part of Mass Audubon's mission "to preserve the nature of Massachusetts for people and for wildlife" Mass Audubon has protected 35,000 acres of land through a combination of outright acquisition of fee interests and conservation restrictions on public and private land. This land makes up Mass Audubon's wildlife sanctuary system which we use to connect people with nature, which serves as the base from which we deliver public educational and summer camp programs that reach 230,000 people every year, and which provides opportunities for wildlife watching, nature study and quiet reflection for nearly 400,000 visitors annually.

Recognizing the physical obstacles inherent across our sanctuary system as well as the importance of providing opportunities for those with mobility assistance needs to enjoy and appreciate nature, Mass Audubon has expended considerable time and resources to increase accessibility for our buildings, trails, and programs. Mass Audubon is actively engaged in bringing its nature centers into ADA compliance, dedicating a portion of its capital budget every year for this purpose, as well as fundraising for specific initiatives. All new capital construction meets or exceeds ADA requirements.

As of August 2012, Mass Audubon has 10 sanctuaries that have trails that are designed to provide visitors with accessible nature trail experiences and Mass Audubon has become a recognized leader in the provision of all-persons access in Massachusetts. Accessible trail improvements have been made at Drumlin Farm in Lincoln, Blue Hills in Milton, Broad Meadow Brook in Worcester, Broadmoor in Natick, Arcadia in Easthampton, Pleasant Valley in Lenox, Wellfleet Bay on the Cape, Felix Neck on Martha's Vineyard, Stony Brook in Norfolk, Attleboro Springs in Attleboro, and the Boston Nature Center in Mattapan. Sensory trails at Stony Brook in Norfolk, Broadmoor in Natick, Attleboro Springs in Attleboro, and Arcadia in Easthampton provide an outdoor trail experience for those with visual impairments, and many sanctuaries,

---

<sup>1</sup> This document provides guidelines for the use of other power-driven mobility devices (OPDMD) on land owned and/or managed by Mass Audubon pursuant to the US Department of Justice (DOJ) regulations amending the Americans with Disabilities Act (ADA), Title II regulation, 28 CFR Part 35, effective March 15, 2011. This procedure does not apply to wheelchairs which are permitted by law on all pedestrian trails or to privately owned and managed lands on which Mass Audubon holds conservation restrictions.

including Joppa Flats in Newburyport, offer programs targeted to enhance accessibility to the visually impaired. The vast majority of our nature centers are fully accessible and those few that currently lack full access are planned to be addressed. Mass Audubon is also in the midst of a three-year project to provide enhanced interpretation at eight sanctuaries across the state for the visually impaired, including audio tours, Braille signage, maps and guides, and related materials. Our *Guide to Wildlife Sanctuaries*, a publication that is mailed to each new member of Mass Audubon and is also available to visitors at each staffed sanctuary, contains a chart of facilities that clearly identifies sanctuaries with accessible restrooms and nature centers, and visitors to our website can find the same information online.

Mass Audubon seeks to provide a high quality visitor experience that is focused on quiet appreciation of nature and the outdoors, with recreational activities carefully selected to maintain this visitor experience, to protect the natural resource and wildlife habitat values of our properties, and to minimize conflicts among visitors and with program participants. In making decisions about visitor uses and facilities, Mass Audubon policy notes that *“ecological values and the recommendations of a sanctuary ecological management plan will be considered and given precedence in making decisions about siting of trails and other infrastructure, developing new intensive use zones, managing individual species of plants and animals and conducting other activities that may affect the wildlife habitat value of a sanctuary.”*<sup>2</sup> The same policy also states that *“trails, structures and other facilities are to be sited, constructed and operated so as to avoid short or long-term adverse effects on rare species habitat or exemplary natural communities.”*<sup>3</sup> For these reasons, horseback riding, dogs, trail running, hunting, bicycling (including mountain bikes)<sup>3</sup>, and ATVs are generally not permitted on Mass Audubon land. Vehicular use of primitive access roads by trained staff is rare and is generally limited to occasional land management or emergency purposes. Motorized vehicles are never used by Mass Audubon on “single track” pedestrian trails.

Mass Audubon’s sanctuaries contain a wide variety of trails, with a wide variety of conditions including wet areas and stream crossings, rocky areas, steep slopes, boardwalks, and bog bridging. Many of these trails are narrow and/or are topographically unsuitable for use by power-driven mobility devices. Weather and environmental conditions can change quickly resulting in deep mud and eroded areas or tree limbs across trails. Physical space to reverse direction on a trail may not be available.

---

<sup>2</sup> Policy on Siting Interpretive Structures and Other Facilities on Mass Audubon Wildlife Sanctuaries, 1/5/2006

<sup>3</sup> “The use of bicycles or other mechanized transportation within sanctuary lands is generally not compatible with the primary purpose of Mass Audubon’s property holdings. Conflicts may include the destruction of vegetation, soil erosion, safety issues, disturbance of wildlife, and interference with the quiet enjoyment of nature by other sanctuary visitors. Therefore the use of bicycles, including so-called mountain bicycles designed for off-road use, is generally prohibited on Mass Audubon sanctuaries.” – from Procedure Regarding Bicycles at Sanctuaries, December 22, 2005.



## **OPDMD Procedure**

This OPDMD Procedure provides guidelines for the use of “other power-driven mobility devices” (OPDMD) on land owned and/or managed by Mass Audubon pursuant to the US Department of Justice (DOJ) regulations amending the Americans with Disabilities Act (ADA), Title II regulation, 28 CFR Part 35, effective March 15, 2011. **This procedure does not apply to wheelchairs which are permitted by law on all pedestrian trails.**

This procedure is designed to balance the important goal of expanded access by those needing mobility assistance with the importance of physical safety for all trail users, the need to protect sensitive natural and cultural resources (e.g. wetlands, riparian systems, rare species) from degradation or adverse impacts by noise, the need to ensure that trails are used in a manner consistent with their design and are not physically damaged or degraded by such use, and the importance of quiet appreciation of nature by visitors and programs participants on our sanctuary lands. It takes into consideration DOJ’s specific Assessment Factors as they apply to Mass Audubon sanctuary lands in identifying the types, sizes and weights of vehicles that are appropriate on Mass Audubon trails.

1. The use of electric or electronic power-driven mobility devices is generally permitted on Mass Audubon trails by those with the need for such devices subject to the following requirements and limitations:

- a. To maintain the safety of all trail users, power-driven mobility devices must be operated on Mass Audubon trails at a safe speed, not exceeding four (4) mph. Where other visitors are present and visible on the trail, a safe speed is likely to be less and is the average speed at which other users are traveling on the trail, typically 2-4 mph.
- b. Due to the design constraints of most Mass Audubon trails and the need for trail users to be able to pass while remaining on trail, power-driven mobility devices must be no greater than 36” in width unless a single visit pass is approved in advance for use of a larger vehicle at a specific site or trail. Passes may be acquired by contacting the relevant sanctuary director/site manager.
- c. Due to design constraints, power-driven mobility devices used on trails with boardwalks, bridges, culverts and observation platforms shall be limited to a total weight of 500 pounds, which includes the vehicle, plus rider and any cargo or passengers.
- d. Due to the physical damage likely to be done to trails from their use, tracked vehicles of any kind are prohibited.
- e. Power-driven mobility devices must remain on designated trails.
- f. All trail users need to make informed decisions about whether they can safely use a particular trail. Trails have generally not been designed for vehicular use (e.g. bridges and boardwalks may not have edge restraints and tree roots are common.) It is recommended that visitors using power-driven mobility devices who are unfamiliar with

trails contact the sanctuary director/site manager for local trail conditions in advance. Contact information is available on Mass Audubon's website at [www.massaudubon.org](http://www.massaudubon.org) or by calling 781-259-9500. Due to the volume of visitors at staffed sanctuaries with nature centers, users with power-driven mobility devices must check in at the nature center prior to using the trail system to learn of any site specific conditions or programs in progress which may affect trail accessibility.

g. Mass Audubon reserves the right to close any trail to pedestrian and/or vehicle use due to wet or icy trail conditions. Information about trail closings will be posted at the site and on Mass Audubon's web page.

2. Power-drive mobility devices with internal combustion engines are prohibited on Mass Audubon land.

3. Mass Audubon staff and volunteers may ask a person seeking to use a power-driven mobility device on Mass Audubon land to provide a credible assurance that the device is required because of the person's disability. The staff member or volunteer shall accept the presentation of a valid, state-issued disability parking placard or card, or other proof of disability as a credible assurance that the use of the device is for the person's mobility disability. In lieu of a valid placard or card, the staff member or volunteer shall accept as a credible assurance a verbal representation that the device is being used for a mobility disability and shall not ask the person using a device about the nature and extent of the disability.

Approved:

Gary R. Clayton

Date: September 20, 2012



### **Mass Audubon Statement on Service Animals**

Federal and state laws apply to service animals and places of public accommodation such as Mass Audubon sanctuaries that are prepared for public visitation. In Massachusetts, this includes service animals that provide emotional comfort and support.

Our wildlife sanctuaries provide habitat for wildlife. Resident wildlife, living freely on the sanctuary or residing in display enclosures, and resident livestock used for farming or ecological management, can perceive even well-trained service animals as predators. Wildlife in display enclosures, with few places to hide, can become especially threatened in the presence of a dog and have the potential to get injured as they attempt to run or fly away.

For the safety and comfort of wildlife and livestock, to provide safe and comfortable experiences for all our visitors, and to ensure the safety of the service animal/handler team, we ask service animal handlers to please:

- Keep service animals restrained and under control at all times and be aware of the potential risk of injury to our live animals on exhibit by just the presence of a service animal near the exhibit.
- Contact our sites before visiting for the first time for more site-specific information and to discuss how best to accommodate your needs along with the site's wildlife and livestock. If staff resources allow, a Mass Audubon staff member or volunteer may be available to accompany a service animal handler visiting an area of the sanctuary that is of special concern.

At sanctuaries with equine livestock, we cannot allow miniature horses to accompany service animal handlers due to the potential health risk to both the miniature horse and to our animals. Visitors who wish to discuss this further are strongly encouraged to call the individual sanctuary for more information about our policy on miniature horses.

Approved by Laura A. Johnson, Mass Audubon President

November 2012





## **MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION RESOURCES**

**DCR Trail Policy and Program Mission**

**DCR Summary of Guidelines for Accessible Trails**

**DCR Guidelines for Accommodating Visitors with  
Accessibility Needs**

**DCR Accessibility Guidelines**

## Massachusetts DCR's Trail Policy and Program Mission

The Mission of the Massachusetts Department of Conservation and Recreation (DCR) is to protect, promote and enhance our common wealth of natural, cultural and recreational resources.

The DCR's Trails Program seeks to provide a safe, quality recreation experience for a diverse range of trail users while practicing sound stewardship of the Commonwealth's natural and cultural resources. This "Trails Guidelines and Best Practices Manual" meets this responsibility by providing a consistent set of trail management policies, guidelines, procedures, and best practices in sustainable trail development.

## Importance of Trails

Trails contribute significantly to the Commonwealth's health, economy, resource protection, and education.

- Trails connect people to the natural environment: place to place, person to person, and neighbor to neighbor. Trails connect us to scenic landscapes, natural wonders, and cultural resources.
- They make our communities more livable: improving the economy through tourism and civic improvement, and building support for land protection and stewardship.
- They enhance educational opportunities: providing opportunities to improve and test skills, to be challenged, or to learn about our natural or cultural environment. Trails present opportunities for observation, enjoyment, and exploration.
- Trails strengthen each of us: offering opportunities for solitude, contemplation, and inspiration. To some, trails provide a sense of freedom, personal accomplishment, self-reliance, and self-discovery.
- Trails can even help protect rare habitats and sensitive resources: by concentrating use on designated, sustainable pathways.

## Striving for Sustainable Trails

Trails offering a rich and enjoyable experience don't just happen. Creating a sense of place and a sequence of events that add interest and offer challenge are essential to good trail design. Moreover, the placement of any trail on the landscape has an ecological impact. The challenge is to keep impacts to a minimum while providing the desired experience. To be sustainable, a trail must serve the needs of users for generations to come, while preserving the sense of place and protecting the quality of the surrounding environment.

Sustainable trails begin with thoughtful planning, good design, and meticulous layout.

## Education and Information

Education and information can and should be an integral part of any strategy to improve the quality of outdoor recreation experiences, and must be expanded and tailored to encompass a wide variety of age groups, learning abilities and special needs.

## Trail System Planning and Development

Instead of considering each trail individually, the trails in and around DCR facilities should be viewed as components of an integrated system or network. Trails are integral to the activities and services, and resources we are protecting at each facility.

Each Trail System should effectively contribute to three primary goals:

- Highlighting ecological, scenic, and cultural features within our facilities
- Providing specific, enjoyable recreational experiences to users
- Connecting important trail corridors, destinations, and population centers both within and outside of our facilities

Each Trail System should effectively achieve the above goals while simultaneously:

- Avoiding sensitive areas
- Meeting the expectations of users
- Minimizing ecological impacts
- Minimizing maintenance requirements

#### Identify Features and Experiences

**Identify Scenic, Recreational and Cultural Features:** On your map(s), highlight the scenic, recreational and cultural features within your park that you want to draw visitors to, such as water resources, ridge lines, summits, vistas, long-distance trails, notable environments, historic structures, cultural landscapes, geologic features, etc.

**Buffers, Wetland Impacts** Consult with MNHESP to determine appropriate buffer to rare, threatened and endangered species. Consult with Historic Resources to determine appropriate buffer to historic/cultural resource. Activities within wetland resource buffer areas are regulated by Massachusetts Wetland regulations and local conservation commissions. Projects within 100 feet of a wetland or within 200 feet of a perennial stream will require the submission of a Request for Determination of Applicability form to the local conservation commission.

#### Use Natural Infiltration and Best Practices for Stormwater Management

Whether paved or natural trails, one of the most critical components of trail design and management is to keep the trail away from the water and the water off the trail.

On highly developed trails, the use of natural, dispersed infiltration systems such as vegetated swales and “rain gardens” offers advantages over engineered storm water control structures such as storm drains and catch basins.

#### Limit Tread Erosion through Design and Construction

To minimize trail erosion and impacts to water resources use sustainable trail design and construction techniques such as: reducing the “tread watershed”, “outslope” the trail (slope it away from the bank) to facilitate natural drainage across the trail, and provide appropriately spaced waterbars and drainage dips. See the Elements of Design section for more details.

#### Building an Enjoyable Trail Experience

Beyond the issue of trail sustainability, the most successful trails are a reflection of the settings and landscapes they traverse. People purposefully choose specific settings for the experience they seek, and the trail should reflect those expectations. The more natural the setting, the more the trail needs to be shaped by nature. The more urban the setting, the more the trail needs to highlight local landmarks and points of interest and provide a social atmosphere.

Well-designed trails will also use natural and built elements to create sequences of visual, physical, and emotional experiences that are pleasing to the trail user. All aspects of a site—its topography, viewsheds, water features, ecological communities, cultural sites, developed areas, roads, and trails—



should be perceived as part of the sequence of events that give the trail its character. To be successful, the collective sequence must also meet the expectations of the visitor in terms of desired mode of travel, setting, level of difficulty, and length of trail.

To achieve this goal, DCR proposes to adopt the Forest Service Trail Accessibility Guidelines (FSTAG) available at [fs.fed.us/recreation/programs/accessibility/FSTAG.doc](https://fs.fed.us/recreation/programs/accessibility/FSTAG.doc).

**Massachusetts DCR Universal Access Program's  
SUMMARY OF GUIDELINES FOR ACCESSIBLE TRAILS**

(Based on Forest Service Trail Accessibility Guidelines, May, 2006)

This chart should be used as a guide only. Contact DCR's Universal Access Program for assistance in evaluating, designing and developing new or altered trails.

ACCESSIBLE TRAIL STANDARDS Trail Grade (max) (*1)	w/ resting intervals (*2)	Cross Slope (max)	Obstacle Height (max)	Trail Tread	
5% max. for any distance 8.3% for 200 ‘max. 10% for 30’ max. 12.5% for 10’ max.	N/A, not required @ 200’ max. @30’ max. @ 10’ max.	5% (*2)	2” height max.	Firm & stable	
Clear Width	Openings	Passing Space Interval	Edge Protection	Protruding Objects	Signs
36” (*3)	½” max. diameter	Every 1000’ when clear width less than 60”. 60”x60” min. or T-shape min. 48”	3” min. height (where edge protection provided)	80” min. clear head space (or provide barrier to warn blind)	At trailhead; identify total length of trail & first point of departure

## DCR Guidelines for Accommodating Visitors with Disabilities



DCR is committed to Universal Access and offers access to park facilities and programs to all visitors. DCR's Universal Access Program is recognized as one of the best in the country given its wide range of programs, locations, and recreational accommodations. Therefore:

- Waive day use parking fees for visitors with Handicap or Disabled Veterans Plates or Placards.
- Treat all visitors in a respectful, friendly, and inclusive manner. Learn about your park's accessible features: parking spaces, wheelchair routes, curb cuts or ramps, picnic tables, restrooms, beach access, adaptive recreation equipment, and programs. Be ready to answer questions, offer a Universal Access brochure and/or provide directions.
- Keep access zones open and unblocked while working. Report changes in accessibility to your Supervisor, such as floods, erosion, and illegal parking.
- Offer assistance if someone needs help, especially if you have relevant training. If your offer is accepted, ask how you can help, then follow directions. If your offer is declined, respect their independence. The only time to assist someone without their permission is in an emergency. Do not transfer individuals in or out of wheelchairs unless you have been professionally trained and/or it is an emergency. If visitors need to be transferred they should plan ahead and come with their own transfer assistance.
- Do not ask visitors about their disability.
- Wheelchairs, crutches, and other medical equipment should be respected as part of the body and should not be touched or moved without the owner's permission, except in emergencies.
- Allow guide/service animals anywhere in the park, including pool facilities and beaches. Service dogs are excluded from pools but must be allowed on the pool deck and anywhere else the public can be. Service dogs and mini horses are the animals officially recognized by the federal government for service to people with disabilities. These animals are not pets, should be under the owner's control and are trained to provide specific types of assistance to someone with a disability. There is no standard certification for service dogs and anyone can buy a service dog vest online. A working service dog should be an attentive, well-behaved animal ready to assist its owner on command. It should not pose any direct threat to safety. Allergies are not considered a threat. You can ask if a dog has been trained to assist because of a disability. You cannot ask for a demonstration of the work it performs.
- Suggested process for service dog admittance into "No dogs allowed" areas: Inform the individual that dogs are not allowed there. At that point the person may state that the dog is a service dog or a service dog in training. The law requires that you take the person at their word. In that case, the employee should inform the individual that the dog will be allowed to accompany the person as long as the service dog is under the person's control, the dog is housebroken, and that there is also a requirement that the dog be on a leash, harness or tether unless that would interfere with the task for which the dog is trained. Afterwards, if the dog is not under control or it becomes obvious that it is not housebroken, the person can be told their dog must be removed from that location. DCR employees are not responsible for removing or caring for the service animal. The person to whom the service animal belongs is responsible for removing, safely securing, and caring for the service dog after it has been removed. That person must be allowed to return to the program or venue without the dog present. Report complaints or requests to your Supervisor. Complaints often serve as requests for improvements. If you have questions regarding accessibility issues, contact the DCR Universal Access Office at 413-545-5353.

## Accessibility Guidelines for Park Interpreters



Through creative interpretive programs that connect visitors to the natural world, you have a unique opportunity to make lasting positive impressions. To promote inclusive programs and interactive educational experiences:

Consider people of all ability levels as you design your programs and include accessibility information in your publicity. Use the most accessible locations in your park most for standard programs. Many disabilities are not obvious, so use teaching techniques suitable to all learning styles. Include the phrase “Reasonable Accommodations Upon Request” on flyers—give readers a date by which to request reasonable accommodations and include a contact phone number. Send flyers and calendars to local organizations serving people with disabilities (ask your local/state Disability Commission for a list.)

Maintain a friendly and comfortable attitude during programs. Practice courtesy and do your best to help everyone see and hear you. If leading a walk, provide information on distance and terrain up front so participants know what to expect. Allow people to drop out partway if needed or alter the walk to keep the group intact. Wait for everyone to catch up before speaking. Provide pauses to allow people to assimilate information.

Always speak directly to the individual who is speaking with you, even if you can’t understand them or someone else is speaking for them.

People with hearing impairments may carry assistive listening systems and offer you a transmitter so they can control the volume of your voice and hear you better. People with speech impairments may have a communication device or board to assist with their communication. Be willing and make the effort to enhance communication and promote clear understanding.

While speaking, use simple, clear and concise language. Define unfamiliar words and avoid vague language. Use experiences and objects that engage all the senses. Use additional descriptive language if your event includes people with visual impairments. Offer handouts in large print (14 point or larger) on non-glossy paper, with a simple typeface and high contrast between text and background color to make them readable by a broader range of the population.

If someone who is blind needs you to guide them, allow them to hold your arm so they can navigate alongside you safely.

If American Sign Language (ASL) or another form of deaf communication is requested in advance of a program, check with your Supervisor and contact the Universal Access Program Office if necessary at 413-545-5353. If visitors are using ASL or lip reading, position yourself in good lighting and avoid blocking your mouth.



# US Forest Service Trail Accessibility Guidelines 2013

FIGURE 1. NATIONAL PARK SERVICE - NORTH COUNTRY NATIONAL SCENIC TRAIL

TRAIL CONSTRUCTION DESIGN STANDARDS Standards (desired)	ROS Class				
	Urban	Rural and Roaded Natural	Semiprimitive	Primitive	
<u>Tread Width</u>		48"	24"	18"	*
Hiking Segments		60"	36"	28"	
Accessible Segments					
<u>Clearing Width</u> (each side of tread))		24"	12" (WIDNR-24")	12"	*
<u>Clearing Height</u> (min.)		10'	8' (WIDNR-10')	8'	*
<u>Slope(max.sustained )</u>		10%	10%	15%	*
Hiking Segments		5%	8%	12%	
Accessible Segments					
<u>Slope (max.)</u>		15% for 100'	20% for 100'	30% for 100'	*
Hiking Segments		8% for 30'	10% for 50'	10% for 50'	
Accessible Segments					
<u>Cross Slope (max)</u>		3%	5%	8%	*
<u>Other Accessible Segment Standards</u>		N/A	600'	1200'	N/A
Passing Spot Int.- max		1200'	1200'	1/2 mile	N/A
Rest Area Interval- max					
<u>Surfaces</u> <u>Accessible Surfaces</u>		Asphalt. Concrete. Stabilized- aggregate. Screening(1).Wood Chip. Sod. Asphalt. Concrete. Stabilized-aggregate.	Native. Wood Chip(2). Stabilized-aggregate. Screening(1). Asphalt. Stabilized-aggregate.	Native Native. Stabilized-aggregate.	Native Native

**Table 2: Multi-Use Trail Design Features and Recommended Guidelines for Construction of New Trails**

Trail Design Feature	Recommended Guideline
<b>Alignment</b>	Layout should fit to the terrain. Trail should follow the contours of the area. (curvilinear) (2,3, 4)
<b>Grade</b>	Max. Pitch - 10% slope; Max. Sustained Pitch - 12% slope; 15% slope may be allowed for short sections depending on the physical and environmental constraints. Percentage of slope is expressed in vertical rise per 100 feet of run.) (2, 4)
<b>Clearing (Vegetation)</b>	Min. Width - 8 ft.; Height - 10 ft.; for 48" to 60" tread (1, 2, 3, 7, 10, 11)
<b>Tread</b>	Min. - 48"; Max. - 60" for multi-use classification. (1, 2, 3, 8, 11)
<b>Line of Sight</b>	1. Min. +/- 85 feet for trail grades of 5-10% 2. Min. +/- 50 feet for trail grades of 10-12% and at blind turns (2, 4, 5)
<b>Bench Construction/Sideslopes</b>	1. Sideslopes between 10 to 30 percent, excavation of the trail bed shall be constructed with a balance section of 1/2 cut and 1/2 fill. 2. Sideslopes between 30 to 50 percent, will require a 3/4 bench cut with 1/4 fill construction to accommodate the trail bed. 3. Sideslopes above 50 percent, the entire trail shall be full bench cut construction. (2, 4, 7, 8, 9)
<b>Outslope</b>	2%-5% from uphill (inside) edge to outside edge of trail (1, 2)
<b>Climbing Turn</b>	Constructed on sideslopes less than 30 percent (4)
<b>Switchbacks</b>	Curve constructed on sideslopes from 30% to 45%. Switchback curve is established with a 6-foot radius at the inside of the turn. The maximum grade entering the turn shall be 5% maximum for 15 feet. The turn should be flat if possible (1, 2, 3, 4, 7, 10, 11)
<b>Turnouts/Passing Sections</b>	1. Trail grades between 5%- 10% placement at +/- 500 ft. 2. Trail grades between 10%- 12% placement at +/- 100 feet. (2, 6)
<b>Vista Points</b>	Vista points should be developed at significant outlook areas that will allow for rest and an aesthetic visual experience (2)
<b>Rolling Grade Dip</b>	A cross drainage swale that is placed at 45" to the trail with a flow line of 4% from uphill to downhill with rock rip-rap outfall. This provides a smooth transition for trail runners and mountain bicyclists (1, 2, 3, 8)

## Considerations for Visual Accessibility of Text

### FONT SIZE

**DISPLAYS:** Text should be 18 points (3/16") or larger letters, 5' or less above the ground.

**HANDOUTS:** Please have some at a minimum of 14 points (just under 1/8"), on non-glossy paper, for visitors with visual impairments.

As people age, their eyes typically have trouble reading fine print. This can happen gradually or fairly quickly. So print that is quite readable to a younger person may be completely unreadable to an older person. It may just appear as a blur.

### FONT STYLE

Sans serif fonts are preferred. But both serif and sans serif are acceptable. The main consideration for typeface is readability. Helvetica, Arial, or similar sans serif fonts are usually the best choice for easiest reading.

Readability is affected by factors such as amount of text, line length, and line spacing. Avoid crowding text. Empty space around text makes it easier to read. There are plenty of readable, familiar fonts that can also convey "personality."

Familiarity has a great impact on readability. The more familiar the font is to your readers the more likely they are to stick with the text.

The consensus is to avoid unfamiliar typefaces: Some fonts have a very crowded look.

CAPITALIZED TITLES ARE FINE BUT PARAGRAPHS THAT ARE WRITTEN IN ALL CAPITAL LETTERS ARE MORE DIFFICULT TO READ. IN PART, THIS IS BECAUSE EVERYTHING IS EMPHASIZED. CAPITAL LETTERS TEND TO CROWD TOGETHER MORE THAN LOWER CASE LETTERS.

Paragraphs that are written in both upper and lower case letters are easier to read. This is because not everything is emphasized. When both upper and lower case letters are used in a paragraph, it's easier for the reader to see where one sentence ends and the next one begins.





## **MASS AUDUBON ACCESSIBLE TRAILS RESOURCE MATERIALS**

**Evaluation Plan for 2010-2013**

**Questionnaire for Accessible Trails Feedback**

## **Mass Audubon Accessible Trails Project**

### **Evaluation Plan for 2010-2013**



#### **Evaluation Goal**

The evaluation goals of Mass Audubon's Accessible Trails Project include:

- Monitoring and accountability of deliverables
- Gather input from key stakeholders as part of needs assessment
- Gather feedback from key stakeholders during design phase @ each site (on-going assessment)
- Analysis of user feedback as ongoing assessment for overall project success.
- Gather feedback from key stakeholders after project completion.

#### **I. STAKEHOLDER ASSESSMENT**

The stakeholders for Mass Audubon's Accessible Trails Project include people with visual, hearing, and mobility impairments, general visitors to our sanctuaries, and Mass Audubon staff and volunteers who work at our sanctuaries.

Stakeholders will have an opportunity to participate in targeted focus groups, planning meetings at the participating sanctuaries, as well as formal on-going and summative evaluation activities.

<b>Table 2. Stakeholder Assessment and Engagement Plan</b>			
<b>Stakeholder Category</b>	<b>Interested or Perspective</b>	<b>Role in the Evaluation</b>	<b>How and When to Engage</b>
People with visual, hearing, and mobility impairments	Trail Users	Needs assessment, formative, summative	Focus group, formative questionnaire at trail, summative evaluation at trail
Parents of children	Trail Users	Needs assessment, formative, summative	Focus group, formative questionnaire at trail, summative evaluation at trail
Mass Audubon staff and Volunteers	Educating/Welcoming User Groups	Needs Assessment, formative, summative	Planning meetings at Sanctuary throughout project; trained to facilitate questionnaires throughout life of project

#### **II. BACKGROUND AND DESCRIPTION OF THE PROGRAM AND PROGRAM LOGIC MODEL (see Logic Model)**

#### **III. DATA COLLECTION**

Methods: Focus Groups, written surveys, facilitated surveys, monitoring number of visitors and visiting groups. Data will be collected throughout the duration of the project—staggering different methods as projects progress. Kris Scopinich, Lucy Gertz, and field staff at participating sanctuaries will be responsible for collecting data from trail users and potential user groups. Data will be sent to Kris Scopinich and Lucy Gertz who will collect and analyze data, and share findings.

## Questionnaire for Accessible Trails Feedback

### Mass Audubon Accessible Trails Project

*The purpose of this survey is to gather information from visitors about their experience with Mass Audubon's new accessible trails and trail resources. We are very thankful for your input. We will use this information to improve the design of trails and trail resources for all visitors. Your ideas are important to us. Please complete this survey and return it to the nature center before you leave the sanctuary. Thank you very much.*

### Mass Audubon Accessible Trails—Planning your Visit

1. Is this the first Mass Audubon accessible trail you have visited?

☐ Yes ☐ No

If no, which other trails have you visited? \_\_\_\_\_

2. How did you learn about the accessible trail you just visited?

3. Did you use the Mass Audubon website to prepare for your visit?

☐ Yes ☐ No

If no, were you aware that Mass Audubon's website contained resources including maps, trail guides, and downloadable audio tours for our suite of accessible trails?

☐ Yes ☐ No

4. If you did access Mass Audubon's website, please rate your level of agreement with the following statements.

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Audio Tour was easy to download	1	2	3	4	5
Map and Trail Guide was easy to download	1	2	3	4	5
Sanctuary information was easy to locate	1	2	3	4	5
Tools for planning my visit were useful	1	2	3	4	5
Website was easy to navigate	1	2	3	4	5
I felt prepared after accessing the website	1	2	3	4	5



5. How effective was the Mass Audubon website in helping you prepare for your visit?  
(circle one)  
very effective      somewhat effective      satisfactory      somewhat ineffective      ineffective

6. Were you welcomed by a Mass Audubon staff member or volunteer when you arrived at the nature center?  
☐ Yes      ☐ No

7. Were you offered any additional resources or support?  
☐ Yes      ☐ No

If yes, please describe what resources or support was offered?

### **Mass Audubon Accessible Trails—On the Trail**

8. Which trail resources did you use? Did you bring them or did you receive them from the nature center staff? *Please circle from the following options below.*

<u>Trail resources used</u>			<u>Source of resources</u>		
map	audio	brochure	brought resources	received from staff	both

9. How comfortable did you feel accessing the trail? (circle one)

Unsafe      Uncomfortable      Some Hesitation      Comfortable      Safe

10. How safe did you feel on the trail in terms of trail construction and directional information? (circle one)

Unsafe      Uncomfortable      Some Hesitation      Comfortable      Safe

11. Please rank the following trail elements based on how they enhanced your experience of the trail.

- \_\_\_\_\_ Audio Tour  
 \_\_\_\_\_ Brochure  
 \_\_\_\_\_ Orientation Panel  
 \_\_\_\_\_ Interpretive Trail Signage

12. Which of the following interpretive trail stops did you experience? *Check all that apply.*

- ☐ Orientation Panel/Map at beginning of trail
- ☐ Bird Song Station      ☐ Tree Identification Station
- ☐ Wetland Habitat Station   ☐ Sounds of Water Station
- ☐ Forest Habitat Station   ☐ People, Land, Wildlife Station

13. Which of the interpretive trail stops did you enjoy the most? Please explain.

14. How would you rate your level of experience with each of the following accessible trails elements and resources?

	Very Poor	Poor	Fair	Good	Very Good
Orientation Panel/Map	1	2	3	4	5
Trail design/layout	1	2	3	4	5
Interpretive Stops	1	2	3	4	5
Overall Experience	1	2	3	4	5

### **Mass Audubon Accessible Trails—Future Implications**

15. After you experience at a Mass Audubon sanctuary, how likely is it that you will promote Mass Audubon to other people with accessibility needs?

Very Unlikely

Unlikely

Likely

Very Likely

### **General Information**

16. How would you describe yourself? Check all that apply.

- ☐ Visually Impaired
- ☐ Hearing Impaired
- ☐ Mobility Impaired
- ☐ Cognitively Impaired
- ☐ Other \_\_\_\_\_

17. How far do you live from the sanctuary?

18. How did you travel to the sanctuary?

19. Use the space below to make any additional comments concerning Mass Audubon's Accessible Trails.

Your input is very valuable to Mass Audubon. Thank you very much for your thoughtful responses.

Survey # \_\_\_\_\_