

Cape Henlopen State Park Trail Plan

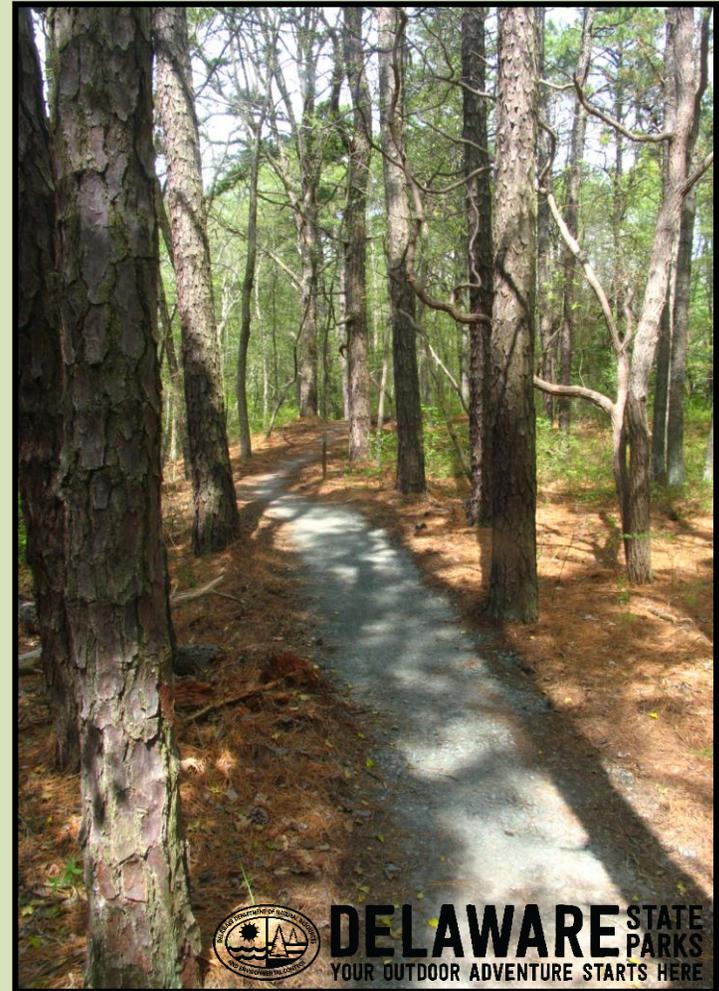


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Executive Summary

Cape Henlopen State Park and the associated recreational opportunities play a substantial role in creating a community that promotes exercise and makes access to the natural environment easier. The support from the cities of Lewes and Rehoboth Beach and local communities has resulted in the expansion of the trail system network for the area. The adoption of this trail plan will help lead the way to almost doubling the miles of trail that will be available to the public for recreation, highlighting the importance of the state park as an integral component to an expanding regional equestrian, pedestrian, and bicycle trail network that will change how the greater community and visitors to the region spend time and live healthier lifestyles.

During the trail planning process for the 2019 trail concept plan, existing natural and cultural resources were assessed and played an integral part in determining best trail locations resulting in alignments to achieve the following:

- Providing a trail system that is safe;
- Minimize impact to high quality habitats;
- Support pedestrian, biking, and equestrian activities;
- Support environmental education;
- Providing technical trail challenge.
- Reduce trail erosion;
- Protect natural and cultural resources;
- Expand the [trail system](#) as an integral part of wider regional trail network;
- Enhance diverse recreational experiences for all non-motorized trail visitors;
- Expand accessible trail experiences; and
- Consider the [essential experiences](#) for the park.

[Appendix A, Maps 1-7](#) highlight the existing conditions for the park in 2019. Based on the existing natural and cultural resources, including areas with wet soil conditions, and social science data, changes to the existing trail system are needed to address trail objectives. Making recommendations for updating trail alignments, the DNREC Trail and Stakeholders Teams considered the following variables and conditions; trail safety; community connections; soil types; topography; hydrology; plant and animal distribution; current and future use; [habitat fragmentation](#); [erosion](#); [accessibility](#); experience; trail use trends; anticipated regional land use growth; park staffing levels; maintenance practices; challenge; and [trail sustainability](#). The planned trail system changes are highlighted in [Appendix A](#) on [Maps 10-16](#).

Planned Trail changes will increase over-all park mileages from the current 19.3 miles to 35.0 miles. This change will result in an increase in mileage for pedestrians, bikers, and equestrians. The change in mileage for all users is related most directly to additions of new trails and will overall account for an increase of 15.7 miles of trail.

A Summary of the planned trail changes are as follows:

- Existing 19.3 mile trail system will be increase by 81% or 15.7 miles to 35.0 miles
- Existing 4.5 miles of single track trail will be increased by 12.8 miles to 17.3 miles through the addition of new trail segments
- Double track will increase from 14.8 miles to 17.7 miles or 2.9 miles
- All-weather hardened surface trails will increase from 16.1 miles to 31.9 miles or 15.0 miles of new trail
- 3.0 miles of designated Pedestrian Only trails will see no change
- Accessible trails will increase from 16.0 to 24.7 miles

Public Participation

The Division began a public participation process with a series of trail user stakeholder meetings in 2016. Division personnel with expertise in park management and operations, administration, enforcement, programming, environmental education, natural and cultural resource stewardship, trail construction and design, and park planning led the public participation component – a core exercise in developing the Cape Henlopen State Park Trail Plan.

Comments from the trail user community, advisory councils and public agencies were valuable in shaping this trail plan. In total there were 8 field visits with park staff, 8 Division Trail Team meetings, 6 stakeholder meetings (includes internal and external members and covered all the trail user groups and several state Councils), and one public open house (specific to the Trail Plan). Use of the Delaware's government web site for posting planning maps, information, and announcements made information more widely available for public review. On April 19, 2018, a public Open House was held at the DNREC building in Lewes on Pilottown Road to review the trail concept plan. Fifty nine people attended the Open House and 62 responses to the draft concept trail plan were submitted via an online comment form, email, and letter correspondence. Below is a summary of the responses (See [Appendix G](#) for a full review of the survey questions and analysis).

- 92% of the respondents supported the plan as proposed.
- 73% of the respondents used trail information such as trail markers maps, and information kiosks (most important amenities).
- 65% of the respondents live in the greater Lewes/Rehoboth Beach Area
- 20% of the respondents live the New Castle County
- 15% of the respondents live in DC, MD, VA, PA, and NJ
- 68% of the respondents use the park each month (42% each week).
- Seeking natural, narrow, challenging, and biking trails were reoccurring themes for many respondents.

Following the April 2018 Open House and comment period, the Division of Parks and Recreation Trail Committee evaluated all public comments to consider the following:

- How comments met Trail Plan objectives
- How comments fit into a larger regional trail system
- How potential recreational alternatives might contribute to regional recreation diversity
- How opportunities can be linked to larger trail systems.

Regional and Local Trail Context

Cape Henlopen State Park (CHSP) is located at the interface of the Delaware Bay and the Atlantic Ocean. See [Map 8](#) in [Appendix A](#) for regional context. It falls within the Atlantic Coastal Plain physiographic region – a region covering ninety five percent of the State. Coastal Plain [geomorphology](#) is characterized by flat, sandy, and in some locations, swampy terrain. CHSP hosts a variety of ecosystems including wooded uplands, freshwater and saltwater wetlands, and dunes. West and south of the park are the densely populated suburban and urban areas of the Cities of Lewes and Rehoboth Beach and Sussex County.

Cape Henlopen State Park's location places it close to major urban and suburban populations of the Philadelphia, Baltimore, and Washington DC metropolitan region- more than 10 million people live within 100 miles of the park. The park's current 19.3 mile trail system combined with other local trails (20+ miles) make these public lands key recreational trail sites both locally and regionally.

Trail Users and Uses

There was an estimated 1,400,000 visitors to Cape Henlopen State Park in 2018. Evidence shows that trail related recreation is one of the most popular activities in the park. From 2010 to 2018 (estimate), the population of Sussex County grew from 197,145 to 229,286 residents, an increase of 16.0%. This increase and population projections for the next 30 years, place a high demand on Park resources in the future.

Below is a summary of the potential trail users in the Park.

- Pedestrians

The term pedestrian includes walkers, hikers, nature watchers, cross-country skiers, geocashers, and trail runners.

- Bicycle Riders

There are a number of sub groups that fall into this category. A few examples are road riders, commuters, competitors, mountain bikers, and general bicyclists who cruise paved pathway through town or at the beach.

- Equestrians

Equestrians include riding, mounted orienteering, endurance riding, carriage rides, and cross country jumping to name a few.

- Special Needs Populations

The Americans with Disabilities Act is a 1990 federal law that helps people with a disability gain equal access to public facilities. More recent guidance is available for recreation facilities including trail widths of 3 feet or greater, grades of 12% and less, limited obstacles (no staircases or steps, or large roots or rocks), firm stable surfaces, and cross slopes 5% or less. Federal agencies (Forest Service and Park Service) are required to use these guidelines. The Delaware Division of Parks and Recreation has adopted and uses the outdoor recreational accessible guidance. The guideline can be referenced at <http://www.fs.fed.us/recreation/programs/accessibility/>

Park Setting

The 5,393 acres of Cape Henlopen State Park includes not only some of Delaware's most popular ocean beaches, but also represents a natural landscape of dunes, wetlands, and upland forest where for thousands of years Native peoples found bountiful shellfish. Historically, Cape Henlopen was one of the first lands in the New World to be set aside for public use, William Penn so decreeing in 1682. The shifting sands at the mouth of Delaware Bay became hazardous

to ships, and in 1769 the Cape Lighthouse, now fallen into the ocean, was completed. The strategic significance of the Cape became increasingly apparent with the federal government taking ownership of parts of the Cape beginning in the late 19th century. A quarantine station was established on the Bay side of the Cape in 1884, later to become a Naval Station during World War I. World War 2 brought construction of Ft Miles to guard the Delaware, and later a Naval submarine warfare center. Today, the state park offers beach, trail, camping, and other recreation opportunities steeped in nature and history to its visitors.

[2019 Trail System Condition Assessment](#)

In the park today there are a variety of activities that impact trails and trail corridors. Trail location and park activities such as trail maintenance, ranger patrol activities, or trail users on foot, bike, or horse will impact the landscape and soils. Soil disturbance is expected in the development and use of trails, however better trail design and management can drastically reduce widespread trail impacts and erosion.

Today, the trail system at Cape Henlopen State Park is comprised of 19.3 miles of trail that serve hikers, walkers, runners, mountain bikers, bicyclists, equestrians, and other non-motorized trail users. This represents 12% of the total miles across the Delaware State Park trail system (see [Appendix B, Table 1](#)). Of those 19.3 trail miles in Cape Henlopen, 3.0 are designated as pedestrian-only, no miles are designated for equestrians, pedestrians and bikers (see [Table 2](#) below). [Table 3](#) below outlines trail characteristic by categories –surface, widths, permitted uses, and accessibility and the percent that each characteristic represents in the trail system as assessed in 2019. All existing conditions assessments are depicted in [Maps 1 through 7](#) (see [Appendix A](#)).

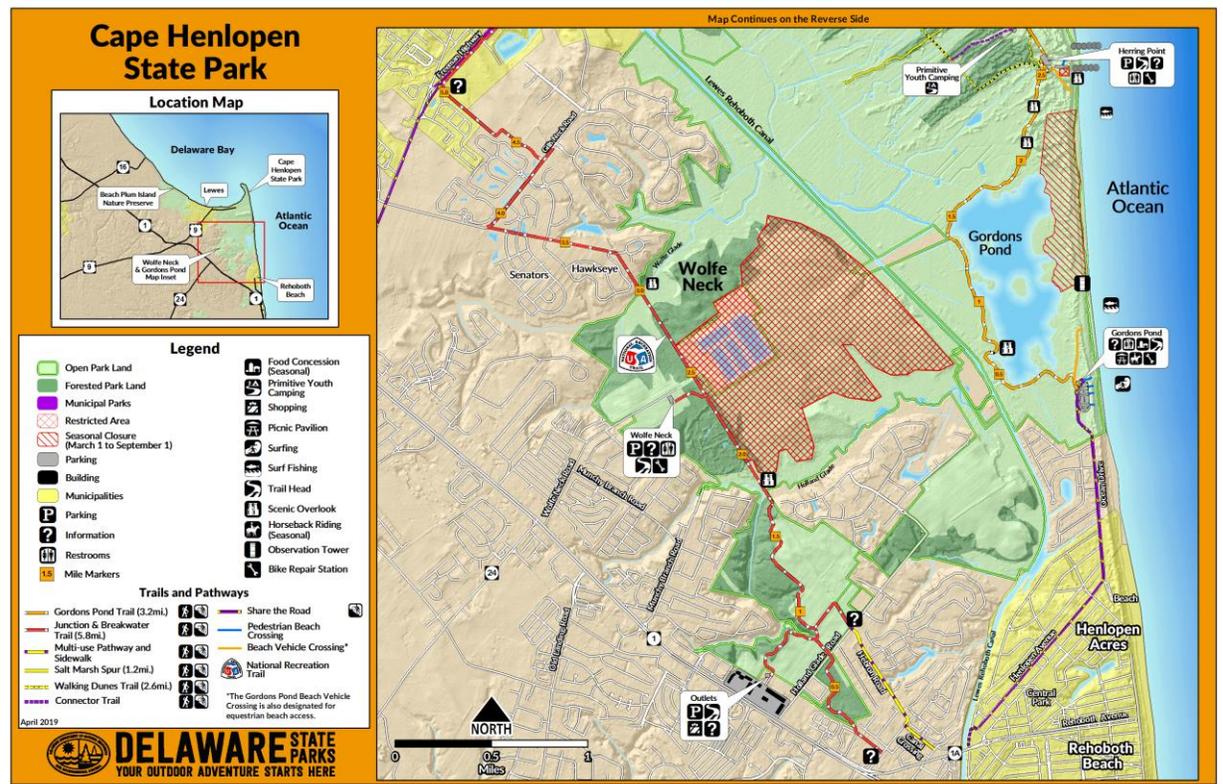
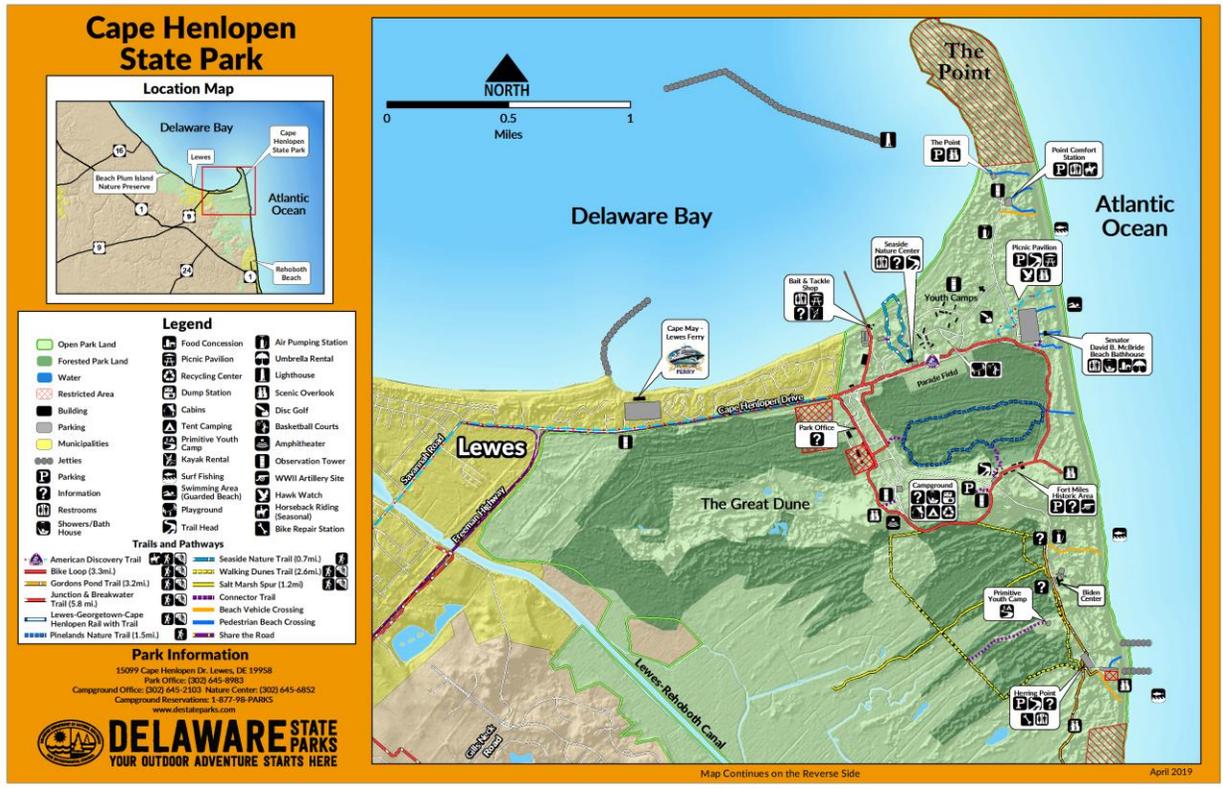
Table 2 - 2019 Trail Uses

2019 Trail Uses	Mileage
Total Trails	19.3
Pedestrian Only	3.0
Pedestrian/Bike	16.3
Pedestrian/Bike/Equestrian	0

Table 3 - Current Trail Characteristics

Trail Characteristics	2019 Trail Mileage	Percentage of Park System
	Total Mileage 19.3	100%
Sustainability		
Good	18.2	94
Fair	0.4	2
Poor	0.7	4
Surface		
Natural	3.2	17
Hardened	16.1	83
Width		
Single Track	4.5	23
Double Track	14.8	77
Permitted Use		
Pedestrian Only	3.0	16
Pedestrian/ Bike	16.3	84
Pedestrian/ Bike/Equestrian	0	0
Accessibility		
Accessible	16.0	83
Not Accessible	3.3	17

Map 1 - 2019 Cape Henlopen Trail System On-line Maps



Trail Descriptions

Access to the trail system is available from several trailhead parking areas and nearby communities. There are eight named trails in the park – the trails are highlighted below.

- **Bike Loop**
The 3.3 mile paved shared-use loop trail is suitable for hiking, biking, strollers, and rollers. The bike loop trail links the park office, nature center, campground, beach bathhouse, youth camps, outdoor fitness area, observation tower, and the Fort Miles Historic Area. The observation tower is a popular stop along the trail. Climb the circular staircase for a panoramic view of the Cape Region.
- **Georgetown Lewes Trail**
The 1 mile shared-use trail segment begins at the Cape Henlopen entrance and runs parallel to Cape Henlopen Drive to Freeman Highway where management by State Parks ends. The trail continues westward toward Georgetown.
- **Gordons Pond Trail**
The 2.2 mile shared-use trail that links Herring Point and the Gordons Pond Trailheads. This accessible trail traverses high sand dunes overlooking the Atlantic Ocean, upland pine forest, and salt marsh habitats.
- **Junction & Breakwater Trail**
The 3.3 mile shared-use trail follows a section of the former Penn Central railroad between Lewes and Rehoboth Beach along an easy contour on a crushed stone surface for approximately 5 miles. The trail is suitable for hikers and bikers. It is accessible from the designated trailheads. Trail users will pass through mature hardwood and conifer forests, open fields, and experience scenic vistas of the coastal marshes at the Wolfe Glade and Holland Glade crossings.
- **Pinelands Nature Trail**
The 1.5 mile pedestrian trail meanders on a gentle grade through coastal upland pine forest over packed and loose sand. Nature enthusiasts will discover four species of pine- including loblolly, Virginia, pitch, and black - and walk past cranberry bogs. Hikers will see old artillery bunkers built during World War II in an area once traversed by rails used to re-supply Fort Miles.
- **Salt Marsh Spur**
A 1.2 mile trail starts near the Biden Center and heads west toward the Lewes Rehoboth Canal. This trail offers opportunities for plant and wildlife observation and views of tidal marsh along its gentle path of stone and packed sand.
- **Seaside Nature Trail**
The 0.7 mile trail for pedestrians, has a loose sandy surface, offers a glimpse of a coastal pine forest and views of the Delaware Bay, Inner Breakwater, fishing pier, and the Henlopen Lighthouse. The trail traverses the bayside location of many of the Park's nature programs.
- **Walking Dune Trail**
The 2.6 mile long shared use trail travels through wooded uplands and tidal marsh. It follows a gentle grade, suitable for all levels of hiking fitness, over sand, crushed stone, or pavement.

See [Table 4](#) for a listing of the major existing trails, mileage, and allowed uses.

Table 4- Existing Trails, Miles & Uses

Trail	Length in Miles	Pedestrian	Biking	Equestrian
Bike Loop	3.3	√	√	
Georgetown Lewes*	1.0	√	√	
Gordons Pond	2.2	√	√	
Junction & Breakwater	3.3	√	√	
Pinelands	1.5	√		
Salt Marsh Spur**	1.2	√	√	
Seaside	0.7	√		
Walking Dune	2.6	√	√	

*within Cape Henlopen State Park – about 5 miles are completed outside the park

**west of Walking Dune Trail is pedestrian use only

A series of trail maps depicting existing condition characteristics of the Cape Henlopen State Park’s trail network were developed to highlight specific trail attributes. Trail characteristics maps include existing 2019 trail system, trail environmental sustainability, permitted uses, width, trail surfaces, and accessibility (See [Appendix A Map 1 - 7](#)). In 2019 the trail system was comprised of 19.3 miles of officially recognized trail ([Map 1](#)). Permitted uses on park trails included pedestrian and biking – equestrian use is permitted on the beach seasonally. Additionally, trails fall into two width categories – single and double track. In 2019 the trail system was comprised of 14.8 miles of double track, defined as widths greater than 36 inches and 4.5 trail miles of single track - widths 36 inches or less.

Trail Infrastructure

Trail infrastructure includes bridges, trail wayfinding markers, information boards, and parking (See [Appendix A Map 7](#)). Currently visitors access Cape Henlopen State Park predominately by car. Ten parking lots serve the majority of trail users. However there is off-site parking options in the Cities of Lewes and Rehoboth Beach and on private lands that connect to the regional [trail network](#).

Trail wayfinding starts at the trailheads. Trailhead parking lots typically have an information board and state park map. Four-by-four posts with plastic over-sleeves or other sign types are installed along trails at intersections where there are directional trail choices. These trail marker posts contain information such as trail names, use, destinations, and latitude and longitude. Trail names have a color coding that corresponds to the same color used on park maps to highlight the specific trail. Maps are located at trailheads and on the Delaware State Park web site at <https://destateparks.com/Trails>.



Typical Trailhead Information Board



Typical Trail Marking Post



Typical Trail Bridge

Trail Plan

Assessment Process

In analyzing and assessing Cape Henlopen State Park existing trail system, the Division evaluated changes made since the 1998 comprehensive trail data collection effort and determined progress made in achieving trail-related objectives. Geographic Information System ([GIS](#)) and field evaluations were used to assess factors and conditions that characterize Cape Henlopen State Park. GIS technology is valuable in evaluating trails within landscapes and habitats and in decision making for diagnosis to prevention, mitigation and enhancement of trails.

GIS analyses, combined with field reviews, have revealed trail segments that are prone to erosion and limit access. Habitat and natural heritage findings identified by both the Division's Stewardship Program and DNREC Natural Heritage and Endangered Species Program (NHESP) were examined within the context of the existing trail system. Trail relationships to forested blocks, ranked habitat quality, and natural heritage data revealed site specific impacts. Other analyses quantified the scale of trail system overlap with fall-line, floodplain, flat area and hydric soil conditions. Known and potential cultural resource sites were analyzed for their relationship to both the existing and planned trail system.

Analyses and recommendations outlined in this trail system plan for Cape Henlopen State Park are based on the principles of [sustainable trail design](#) and development and trail [best management practices](#) (See [Appendix C](#)). Using GIS tools and field review, resource experts determined impacts to natural resources, cultural resources, and to unsustainable trail conditions (fall-line, hydric soils, etc.) Subsequent Trail Plan sections outline the locations of new trail alignments to achieve the objectives outlined within this plan.

Sustainability

Designing and constructing *sustainable trails* is paramount to protecting natural and cultural resources, providing great trail experiences, providing diverse recreational opportunities, and maintaining the life span of a trail system (see [Appendix C](#)). Trail sustainability is defined as the location of any given trail segment and how the segment relates to contours, drainage, and soil types, and, how well a trail segment withstands the impacts of Climate, weather, and recreational use over time. The better a trail segment withstands these impacts, the more sustainable it is. Reducing impacts to natural resources such as native vegetation and wildlife and cultural resources are key Division [objectives](#) in trail planning. The use of natural surface trails during wet trail conditions impacts sustainability and can dramatically reduce the trail life span. Proper and continued education for park visitors on use etiquette are a sustainability necessity.

Many trail management problems, erosion and user conflict for example, stem from poor trail planning, design, construction, or management. Ignoring best management trail design, construction, and management practices results in accelerated trail degradation leading to an increase in maintenance costs and tasks as well as reduced trail user safety and enjoyment. While all trail users affect the trail surface and surrounding environment, user impacts rise more often when trails are poorly planned and constructed. The Division of Parks and Recreation adopted the principles of sustainable trail design and construction to ensure that trails remain accessible to users, valuable resources are protected, and future maintenance costs are minimized.

Current trail sustainability principles prescribe that all present and future impacts will not burden social, economic and environmental systems. Cape Henlopen State Park's trails currently fall within an acceptable level of sustainability - although there is room for improvements. The analysis of the Cape Henlopen State Park shows that of the current 19.3 total trail miles, about 4% (1.1 miles) is in need of some degree of change or enhancement to achieve a higher level of sustainability and environmental protection.

Designing a sustainable trail and trail system requires the analysis and evaluation of the following elements and factors:

- Cultural resources
- Endangered or sensitive plant and animal species
- Occurrence and health of native plants and animals
- Mature growth forests
- Quality of ecosystems
- Natural drainage
- Topography, slope and grade changes
- Ease of access from control points such as trailheads
- User safety
- Characteristics of trail users
- Accessibility
- Provide interesting experiences across the landscape.

Trails constructed over the past ten years in Delaware State Parks were planned according to sustainability objectives. Current practices adopted by the Division have proven that this planning method is very effective in minimizing the environmental effects of trails.

Objectives

Healthy lifestyles and livable communities are key considerations in the planning process. Walkability and bikeability play a role in how trails are planned and constructed. Creating diverse opportunities for more people and connecting trails to people is critical in helping to turn around the trend of declining number of kids, and adults who participate in outdoor recreation and help mitigate obesity and other health issues.

All State Park trail plans, including Cape Henlopen State Park, have objectives that recommend:

- A trail system that is safe;
- Changes to the trail system that meet socially, environmentally and culturally sustainable principles;
- Minimize [habitat fragmentation](#);
- Enhancing habitat quality through sustainable trail planning and design;
- Supporting environmental education opportunities;
- Supporting pedestrian, biking, and equestrian activities;
- Providing a diversity of accessible experiences;
- Considering existing and future recreational trends;
- Integrating the park's trail system as part of wider regional network of existing and future trail opportunities and makes community connections;
- Adapting to future land conservation measures;
- Reducing costly unsustainable trail maintenance achieved by holistic and sound trail planning, construction and innovative trail maintenance techniques;

- Utilizing the best scientific data and research available such as state-wide GIS data layers, user surveys (SCORP), and trail research (such as best practices, erosion, and recreational impacts);
- Enhancements including trail realignments, bridges, trail uses and trail enhancements within sustainable trail standards;
- Providing a diverse recreational appeal;
- Having a visual environmental quality;
- Including opportunities to enjoy a great diversity of physical settings;
- Providing visitors with a dynamic mix of interesting experiences that range from easy to challenging;
- Considering climate change
- Providing safe trail links between the east and west side of the Cape Henlopen; and
- Providing technical trail challenge

Technical Trail Challenge

National and state recreational use trends indicate adventure sports, including triathlon, adventure racing, backpacking, mountain biking, and climbing (to name a few), showing significant growth in the past several years (Adventure Racing up 28% *Outdoor Foundation Topline Reports*). A reoccurring and increasing trend is the interest of users from all trail related activities seeking a challenge. There are various ways to incorporate “challenge” into a trail experience. Integrating tread obstacles and/or maintaining narrow widths are two options for increasing the technical nature of a trail. Creating more technical options along a trail corridor, utilizing man-made or natural features such as logs or rocks, can provide additional interest and challenge to an otherwise easy trail.



Technical rock added as options alongside accessible trail in Redd Park-City of Newark

Planned Trail System

The Division Trail and Stakeholders Working Group considered the following variables and conditions in making recommendations for new trail alignments: current trail alignments; trail safety; community connections; soil types; topography; hydrology; plant and animal distribution; current and future use; challenge; accessibility; experience; trail use trends; anticipated regional land use growth; park staffing levels; maintenance practices; and trail sustainability.

Final trail alignment recommendations account for natural resource protection, erosion, hydric soil avoidance, sea level rise, and expansion of trail recreational opportunities. Trail additions will account for an increase of 15.7 miles of trail, the overall changes will improve access, sustainability, accessibility, and experience of the trail system.

Final trail alignment decisions were based on reviewing a number of alignment alternatives. [Map 10](#) depicts 35.0 mile planned trail system for Cape Henlopen State Park. [Maps 10 - 17](#) address planned trail [system](#), [sustainability](#), [use](#), [widths](#), [surfaces](#), [accessibility](#), and [infrastructure](#) (see [Appendix A](#)).



Walking Dune Trail

Trail Characteristics

Trail characteristics includes measurable trail conditions such as sustainability, surface, width, permitted uses, and accessibility. [Table 5](#) provides a summary of all current trail characteristics and the planned changes (see [Map 15](#) for planned accessible trails).

Table 5 – Current and Planned Trail Characteristics

Trail Characteristics	Current Trail System	Planned System	Change in Mileage	Percent of Planned System
Total Mileage	19.3	35.0	Increased 15.7	
Sustainability				
Good	18.1	34.6	Increased 16.5	99%
*Fair	0.4	0.1	Reduced 0.3	.5%
* Poor	0.8	0.3	Reduced 0.5	.5%
Surface				
Natural	3.2	3.1	Reduced 0.1	9%
Hardened	16.1	31.9	Increased 15.0	91%
Width				
Single Track	4.5	17.3	Increased 12.8	49%
Double Track	14.8	17.7	Increased 2.9	51%
Permitted Use				
Pedestrian Only	3.0	3.0	No Change	9%
Pedestrian /Bike	16.3	30.1	Increased 13.8	86%
Pedestrian /Bike/Equine	**0	***1.9	Increased 1.9	5%
Accessibility				
Accessible	16.0	24.7	Increased 8.7	71%
Not Accessible	3.3	10.3	Increased 7.0	29%

*Note: some segments of trail that fall into the fair and poor categories are in habitats that are too dynamic to improve the sustainability.

**Note: current winter equestrian access is 4.6 miles of beach.

***Note: winter equestrian access for 1.9 miles of trail and 4.6 miles of beach

Accessibility

This plan includes opportunities for improving access for all visitors including those with disabilities. Currently Cape Henlopen State Park offers 16.0 miles of accessible trail opportunities. Delaware State Parks is committed to providing more accessible trails throughout the statewide trail network. See [Map 15](#) for planned accessible trails.

[Map 15](#) - Planned Trail Accessibility – shows the planned hardened surface portion of the trail system that will meet or exceed Federal trail accessibility guidelines.



Trail Safety

Providing the safest user experience possible is linked to good trail planning and construction, performing needed maintenance, and providing the right information for the users. Safety can be broken into two perspectives – user and agency. From the trail user perspective, where to park, what activities are allowed, how to navigate, what type of users one can expect, how wide, long, and steep is the trail, trail etiquette, and how to seek help are some items that must be addressed to keep trails safe. Not everyone will feel the same level of safety for all the different trail experience such as narrow vs. wide trail, single use vs. shared use, or smooth vs. rough tread surface. Providing the right information for the users is critical in allowing the users to make informed decisions on what experiences are right for them. Trail access and wayfinding information is a critical component to trail safety.

From a managing agency perspective, good planning, construction, and maintenance is required. An understanding of the landscape design challenges, breadth of trail experiences being offered, types of users, volume of users, maintenance needs, and required signage and information to best guide the trail visitors are all key components to safe trail experiences.

Trail Infrastructure

Trail infrastructure includes trail wayfinding markers, information boards, and bridges. [Table 7](#) shows bridge infrastructure – existing, new, replacements, and removals ([see Table 7 notes](#)). This trail plan provides general trail wayfinding guidelines. Signage for any park should include roadside directions to trailheads or major trail access points throughout the park; trailhead information such as mapping and trail characteristics; and clear trail markings throughout the system providing clear direction and safely guide visitors through the trail system back to their point of origin or to their intended destination. An additional layer of wayfinding is a numbering system for marker posts and bridges and graphically representing that numbering system on the park maps.

Park user navigation aids are in the top five of the most used and sought after trail amenity –such as trail maps and markers. Information Centers should be located at all trailhead parking areas ([see Map 16](#)) and will include maps, trail use designations, etiquette, and accessibility information.

State Park trailhead maps exhibit all the official trails – trails constructed and maintained by Delaware State Parks. Maps include trail names, permitted uses, as well as trail width, length and average grade, markers, and bridges. Trail line colors coincide with trail marker colors. For example, the Pinelands Nature Trail is depicted by a blue line on the Park map and with blue way finding markers on posts along the trail. Marker posts are located at trail and road intersections and include trail name (color coded to match map), permitted trail uses, and post number. Posts also contain destination/facility information with directional arrows.

Plan Implementation

Trail Plan implementation in Cape Henlopen State Park will occur in phases over time. System wide trail projects fall into two main categories 1) projects handled by park staff and volunteers or 2) large contract projects requiring engineering and construction companies. Prioritizing projects will be guided by available funding, park planning priorities, public demand, health and safety, and [trail plan objectives](#). Objectives include: safety, accessibility, community linkage, improve sustainability, alternative pedestrian biking transportation corridor, potential or existing level of use, shared use, available funding, available work force, engineering needs, targets key activity, links other key areas of the park, trails, or other regional trail systems. See [Table 6](#).

[Table 6](#) - Planned Trail Maintenance – Existing Trails the following table summarizes planned trail changes for widths, uses, and what might trigger the trail system changes.

Trail	Trail Type	Width Avg.	Current Trail Users	Future Users	Change Required	Trigger
Bike Loop	Double Track	3 feet	Pedestrian Bicycles	(No Change)	<ul style="list-style-type: none"> • Signs • Pavement Markings 	<ul style="list-style-type: none"> • User Safety • Funding
Georgetown Lewes	Double Track	3 feet	Pedestrian Bicycles	(No Change)	<ul style="list-style-type: none"> • Signs • Pavement Markings 	<ul style="list-style-type: none"> • User Safety • Funding
Gordons Pond	Double Track	3 feet	Pedestrian Bicycles	(No Change)	<ul style="list-style-type: none"> • Tread Stabilization • Signs 	<ul style="list-style-type: none"> • User Safety • Habitat Protection • Funding
Junction & Breakwater	Double Track	3 feet	Pedestrian Bicycles	(No Change)	<ul style="list-style-type: none"> • Tread Stabilization • Signs 	<ul style="list-style-type: none"> • User Safety • Funding
Pinelands	Single Track	3 feet	Pedestrian	(No Change)	<ul style="list-style-type: none"> • Reroutes • Signs 	<ul style="list-style-type: none"> • User Safety • Enviro. Protection
Salt Marsh Spur*	Single Track	3 feet	Pedestrian Bicycles	(No Change)	(No Change)	<ul style="list-style-type: none"> • None
Seaside	Double Track	3 feet	Pedestrian	(No Change)	<ul style="list-style-type: none"> • Hardening 	<ul style="list-style-type: none"> • Habitat Protection • Accessibility
Walking Dune**	Single and Double Track	3-10 feet	Pedestrian Bicycles	Pedestrian Equestrian Bicycles	<ul style="list-style-type: none"> • Signs • Map Update 	<ul style="list-style-type: none"> • Approval of Plan

*Note: the segment west of the Walking Dune Trail is pedestrian only

**Note: the segment of trail nearest and mostly parallel to Dune Road is single track

Table 6 - Planned Trail Changes - New Trail

Trail	Trail Type	Width Avg.	Current Trail Users	Future Users	Change Required	Trigger
Great Dune	Single Track	3 feet	NA	Pedestrian Bicycles	• New Trail	• Funding
Unnamed (Spray Field)	Single Track	3 feet	NA	Pedestrian Bicycles	• New Trail	• Funding
Barrow Pit	Single Track	3 feet	NA	Pedestrian Bicycles	• New Trail	• Funding
Point	Double Track	5 feet	NA	Pedestrian Bicycles	• New Trail	• Funding
Glade Farm	Single Track	3 feet	NA	Pedestrian Bicycles	• New Trail	• Road Pathway Development • Funding
Navy Beach Connector	Single Track	3 feet	NA	Pedestrian	• New Trail	• Biden Center Updates • Funding

Action Items

Protection of existing natural and cultural resources and providing recreational opportunities in state designated resource areas is of primary concern. Recreation at Cape Henlopen State Park falls into two major categories, active (such as disc golf) and passive recreation (trail activities like hiking and biking). Lands that fall within the active areas should continue to take the brunt of recreational impact. Lands that fall within the passive areas should be protected to the fullest with limited additional infrastructure added. In response to an internal assessment of the state of the trails at Cape Henlopen, a list of action items have been established that will improve upon the existing infrastructure.

Action items that will provide safer, consistent trail access to and within the park:

- Stabilize trails where needed to meet sustainability and accessibility goals
- Provide more information to visitors on trail characteristics (width, use, surface, accessibility), and etiquette
- Provide more information to visitors on wayfinding
- Replace, repair, remove, or install new bridges
- Work with other agencies to create safe connections between east and west side of the Cape Henlopen State Park
- Create accessible single track trail experiences.

Action items for long term protection:

- Close all trail segments not included in the trail plan and block off access as required
- Monitor degraded areas for natural recovery
- Promote native plant re-colonization
- Analyze access sites as they pertain to hunting in protected resource areas

[Priority Project List](#)

The following project priorities listed below fall into either the short, mid, or long-term category. Short-term priorities should be accomplished in the first few years after official adoption of the plan. Mid-term priorities should be undertaken within three to five years. Long-term projects are at least five years out. Trail project priorities may change from year to year and may be triggered by one or more of the following: park planning priorities, resource protection, user safety, funding, and accessibility.

Short Term:

- Update way-finding system including trail names reconfiguring. See [Map 17](#)
- Rebuild bridge 6 and extend. See [Table 7](#)
- Extend bridges 4 and 5
- Close down select use corridors.
- Stabilize railing on bridge on Gordons Pond Trail.
- Construct Wolfe Neck trails.
- Construct Great Dune Trail.
- Sign and strip paved biking routes to improve wayfinding and safety

Mid Term

- Construct Point Trail

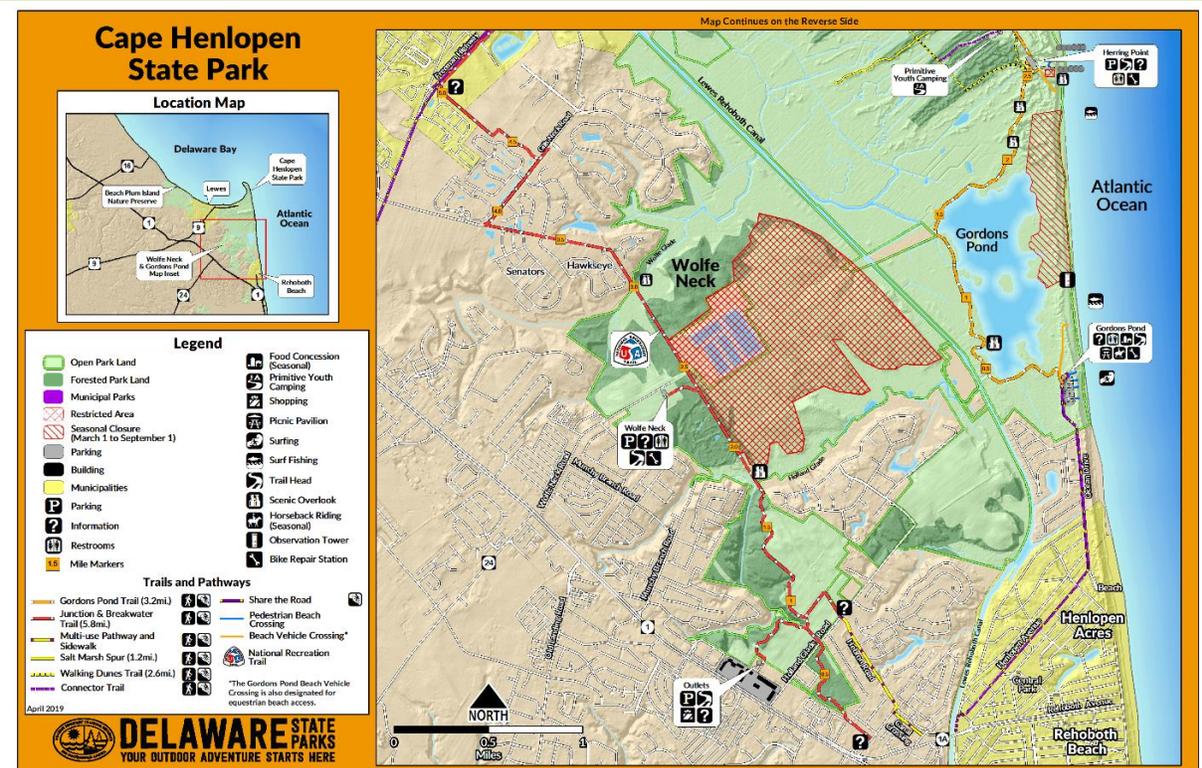
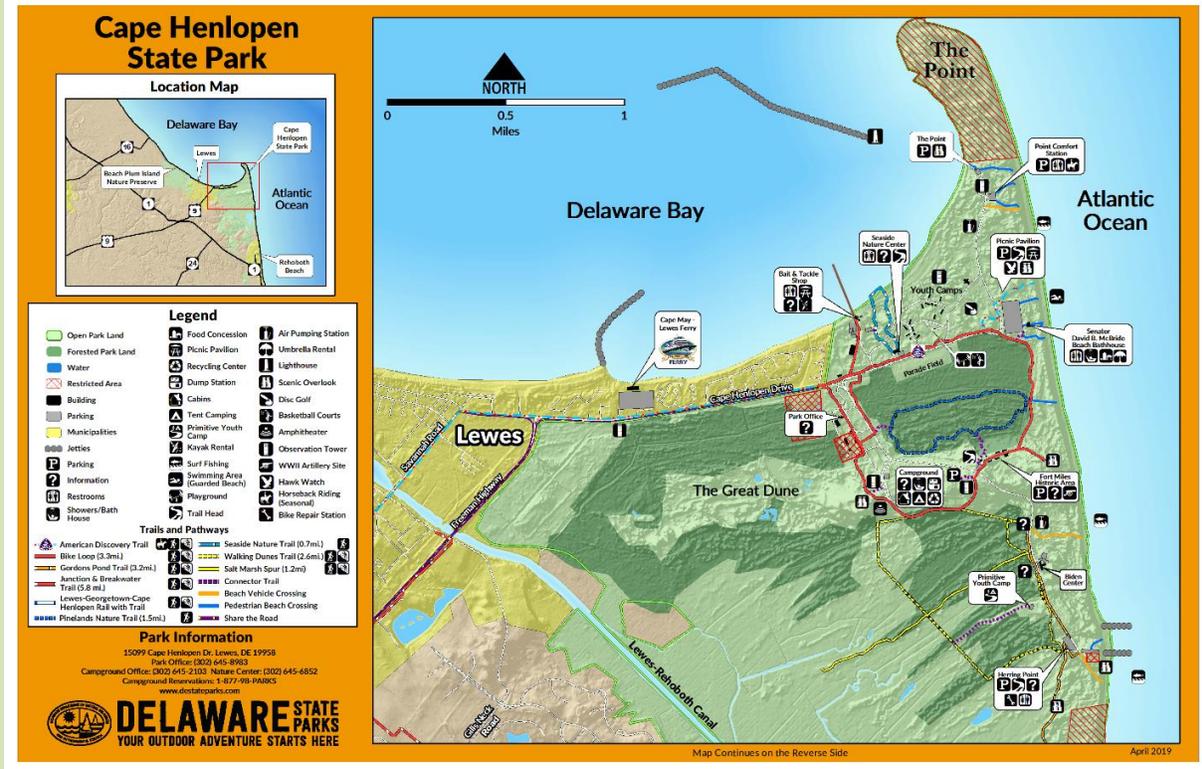
Long Term

- Construction trail along Holland Glade Road
- Construct Glade Farm Trail

Appendix

Appendix A: Existing and Planned Condition Maps

Map 1 - Cape Henlopen State Park - Current On-line Trail Map



Map 3 – Existing Sustainability



Summary: current sustainability metrics are: 0.8 miles of Poor trail, 0.4 miles of Fair trail, and 18.1 of miles of Good trail.

Map 4 - Existing Permitted Trail Uses



Summary: current permitted uses by mileage are: pedestrian only 3.0 miles; 16.3 pedestrian and biking; 0 miles of equestrian use (4.6 miles of equestrian beach use).

Map 5 - Existing Trail Width



Summary: current trail widths by mileage are: single track 4.5 miles; double track 14.8 miles

Map 7 - Existing Trail Accessibility



Summary: current trail accessibility by mileage are: accessible 16.0 miles; not accessible 3.3 miles



	Population						
State	5 Miles	10 Miles	15 Miles	20 Miles	40 Miles	60 Miles	90 Miles
DE	16,094	37,569	65,841	122,637	325,820	405,639	897,934
MD	0	0	0	0	116,195	300,558	2,129,390
NJ	0	0	3,059	30,710	100,802	562,636	1,899,428
VA	0	0	0	0	0	2,411	31,557
PA	0	0	0	0	0	0	2,389,076
Total	16,094	37,569	68,900	153,347	542,817	1,271,245	7,347,385



Summary: Overall the existing 19.3 mile trail system will be increase by 15% or 15.7 miles resulting in 35.0 miles overall.



Summary: Overall with realignments and enhancements the existing 19.3 miles of trail increased to 35.0 miles. Current 3.0 miles of pedestrian only trail will decrease to 6.3 miles; Current 16.3 miles of pedestrian and biking trail will increase to 31.5 miles; and current 2.8 miles of pedestrian, biking, and equestrian trail will increased to 7.9 miles.

Map 13- Planned Trail Width



Summary: Overall, existing 4.5 miles of single track trail will be increased to 30.0 miles. Double track trail will increase from 14.8 miles to 15.7 miles.

[Map 15](#) - Planned Trail Accessibility – shows the planned hardened surface portion of the trail system that will meet or exceed Federal trail accessibility guidelines.



Summary: Overall the existing 16.0 miles of accessible surface trail will increase to 16.6 miles. Current 3.3 miles of trail not accessible will be decreased by 0.6 miles to 29.1 miles.



Appendix B: Tables

[Table 1](#), Statewide Trail Distribution Analysis, provides an overview of the State Park trail systems.

Table 1 – State Park Trail Distribution Analysis

County	State Park	Miles	Percent of Total Trail Miles	Total Miles	Percent Total Trail Miles Per County	Percent State Population
New Castle	Alapocas Run SP	6.5	4%	103.1	67%	59%
	Auburn Heights NP	3.9	3%			
	Bellevue SP	9.7	6%			
	Brandywine Cr SP	16.6	11%			
	Flint Woods NP	2.4	2%			
	Fort DE SP	0.8	1%			
	Fort DuPont SP	1.3	1%			
	Fox Point SP	2.3	1%			
	Lums Pond SP	17.5	11%			
	White Clay Cr SP	38.6	25%			
	Wilmington SP	3.5	2%			
Kent	Killens Pond SP	7.4	5%	8.4	5%	18%
	Fork Branch NP	1	1%			
Sussex	Barnes Woods NP	0.8	1%	43.1	28%	23%
	Cape Henlopen SP	19.3	12%			
	DE Seashore SP	9	6%			
	Fenwick Is SP	0	0%			
	Holts Landing SP	2.4	2%			
	Trap Pond SP	11.6	8%			
Total		154.6	100%	154.6	100%	100%

County	Trail Usage (miles)		Trail Width (miles)		Trail Surfacing (miles)	
	Shared Use	Single Use (Pedestrian Only)	Double Track	Single Track	Natural Surface Tread	Hardened Surface Tread
New Castle	73.1	30	56.8	46.3	63.4	39.7
Kent	4.4	4	6.4	2	3.5	4.9
Sussex	35.2	7.9	39.3	3.8	16.8	26.3
Total	112.7	41.9	102.5	52.1	83.7	70.9

Table 2 - 2019 Trail Uses

2019 Trail Uses	Mileage
Total Trails	19.3
Pedestrian Only	3.0
Pedestrian/Bike	16.3
Pedestrian/Bike/Equestrian	0

Table 3 - Current Trail Characteristics

Trail Characteristics	2019 Trail Mileage	Percentage of Park System
	Total Mileage 19.3	100%
Sustainability		
Good	18.2	94
Fair	0.4	2
Poor	0.7	4
Surface		
Natural	3.2	17
Hardened	16.1	83
Width		
Single Track	4.5	23
Double Track	14.8	77
Permitted Use		
Pedestrian Only	3.0	16
Pedestrian/ Bike	16.3	84
Pedestrian/ Bike/Equestrian	0	0
Accessibility		
Accessible	16.0	83
Not Accessible	3.3	17

Table 4- Existing Trails, Miles & Uses

Trail	Length in Miles	Pedestrian	Biking	Equestrian
Bike Loop	3.3	√	√	
Georgetown Lewes*	1.0	√	√	
Gordons Pond	2.2	√	√	
Junction & Breakwater	3.3	√	√	
Pinelands	1.5	√		
Salt Marsh Spur**	1.2	√	√	
Seaside	0.7	√		
Walking Dune	2.6	√	√	

*within Cape Henlopen State Park – about 5 miles are completed outside the park

**west of Walking Dune Trail is pedestrian use only

Table 5 – Current and Planned Trail Characteristics

Trail Characteristics	Current Trail System	Planned System	Change in Mileage	Percent of Planned System
Total Mileage	19.3	35.0	Increased 15.7	
Sustainability				
Good	18.1	34.6	Increased 16.5	99%
*Fair	0.4	0.1	Reduced 0.3	.5%
* Poor	0.8	0.3	Reduced 0.5	.5%
Surface				
Natural	3.2	3.1	Reduced 0.1	9%
Hardened	16.1	31.9	Increased 15.0	91%
Width				
Single Track	4.5	17.3	Increased 12.8	49%
Double Track	14.8	17.7	Increased 2.9	51%
Permitted Use				
Pedestrian Only	3.0	3.0	No Change	9%
Pedestrian /Bike	16.3	30.1	Increased 13.8	86%
Pedestrian /Bike/Equine	**0	***1.9	Increased 1.9	5%
Accessibility				
Accessible	16.0	24.7	Increased 8.7	71%
Not Accessible	3.3	10.3	Increased 7.0	29%

*Note: some segments of trail that fall into the fair and poor categories are within habitats that are too dynamic to improve the sustainability.

**Note: current winter equestrian access is 4.6 miles of beach.

***Note: winter equestrian access for 1.9 miles of trail and 4.6 miles of beach

Table 6a and 6b - Planned Trail Changes – Existing Trails

The following table summarizes planned trail changes for widths, uses, and what might trigger the trail system changes. Triggers determine when any potential project gets moved to an active funded project. For example: A storm causing a tree to fall and destroy a bridge would trigger a bridge replacement project to keep the trail open and safe

Table 6a

Trail	Trail Type	Width Avg.	Current Trail Users	Future Users	Change Required	Trigger
Bike Loop	Double Track	3 feet	Pedestrian Bicycles	(No Change)	<ul style="list-style-type: none"> • Signs • Pavement Markings 	<ul style="list-style-type: none"> • User Safety • Funding
Georgetown Lewes	Double Track	3 feet	Pedestrian Bicycles	(No Change)	<ul style="list-style-type: none"> • Signs • Pavement Markings 	<ul style="list-style-type: none"> • User Safety • Funding
Gordons Pond	Double Track	3 feet	Pedestrian Bicycles	(No Change)	<ul style="list-style-type: none"> • Tread Stabilization • Signs 	<ul style="list-style-type: none"> • User Safety • Habitat Protection • Funding
Junction & Breakwater	Double Track	3 feet	Pedestrian Bicycles	(No Change)	<ul style="list-style-type: none"> • Tread Stabilization • Signs 	<ul style="list-style-type: none"> • User Safety • Funding
Pinelands	Single Track	3 feet	Pedestrian	(No Change)	<ul style="list-style-type: none"> • Reroutes • Signs 	<ul style="list-style-type: none"> • User Safety • Enviro. Protection
Salt Marsh Spur*	Single Track	3 feet	Pedestrian Bicycles	(No Change)	(No Change)	<ul style="list-style-type: none"> • None
Seaside	Double Track	3 feet	Pedestrian	(No Change)	<ul style="list-style-type: none"> • Hardening 	<ul style="list-style-type: none"> • Habitat Protection • Accessibility
Walking Dune**	Single and Double Track	3-10 feet	Pedestrian Bicycles	Pedestrian Equestrian Bicycles	<ul style="list-style-type: none"> • Signs • Map Update 	<ul style="list-style-type: none"> • Approval of Plan

*Note: the segment west of the Walking Dune Trail is pedestrian only

**Note: the segment of trail nearest and mostly parallel to Dune Road is single track

Table 6b - Planned Trail Changes - New Trail

Trail	Trail Type	Width Avg.	Current Trail Users	Future Users	Change Required	Trigger
Great Dune	Single Track	3 feet	NA	Pedestrian Bicycles	<ul style="list-style-type: none"> • New Trail 	<ul style="list-style-type: none"> • Funding
Unnamed (Spray Field)	Single Track	3 feet	NA	Pedestrian Bicycles	<ul style="list-style-type: none"> • New Trail 	<ul style="list-style-type: none"> • Funding
Barrow Pit	Single Track	3 feet	NA	Pedestrian Bicycles	<ul style="list-style-type: none"> • New Trail 	<ul style="list-style-type: none"> • Funding
Point	Double Track	5 feet	NA	Pedestrian Bicycles	<ul style="list-style-type: none"> • New Trail 	<ul style="list-style-type: none"> • Funding
Glade Farm	Single Track	3 feet	NA	Pedestrian Bicycles	<ul style="list-style-type: none"> • New Trail 	<ul style="list-style-type: none"> • Road Pathway Development • Funding
Navy Beach Connector	Single Track	3 feet	NA	Pedestrian	<ul style="list-style-type: none"> • New Trail 	<ul style="list-style-type: none"> • Biden Center Updates • Funding

Table 7 Existing Trail Bridge or Structure Condition

Trail Bridge Number	2018 Condition	Year Built	Planned Action
1	Good	2003	None
2	Excellent	2014	None
3	Excellent	2010	None
4	Excellent	2016	Extend
5	Excellent	2016	Extend
6	Fair	2008	Replace and Extend
7	Fair	2004	None
13	Good	Unknown	None
20	Good	2000	None

Appendix C: Sustainable Trail Best Management Practices

Designing, constructing, and properly maintaining trails for sustainability is of paramount importance to preserving the designed experience, health, and life span of the trail system. Many trail management problems, ranging from erosion to user conflicts, stem from poor trail planning and design, management, and use. A poorly designed trail, no matter how well it is built, will degrade at a faster rate and cause more problems for managers and trail users.

User type and volume impacts are most notable on natural surface trails. Over the years there have been a number of studies that have examined the relationship between users and the trail. The ability to loosen or displace (move short distances) tread materials will help determine the sustainability of any given trail. Although the “footprint” may look different, the foot and the tire exhibit about the same amount of wear and tear on the trail-pounds per square inch on the tread are actually lower for a bike. The equestrian, at least four times the weight, can have a more dramatic effect on compacting or loosening the tread. Once tread materials are loose they become more susceptible to displacement and/or erosion. Depending on soil conditions, user type and volumes, trail width, canopy cover, and slopes, the amount and distance of displacement or erosion will vary. In general the distance for displacement will not exceed one or two feet. Erosion on the other hand is not confined to short distances; in fact soil may be carried hundreds if not thousands of feet by water.

Site conditions all being equal, the heavier horse will loosen and displace many times more tread material than either the pedestrian or biker. However, sheer numbers of any one user type can overwhelm just a few of another. The impact of twenty hikers in a muddy area far exceeds the impact of one horse. Nor are a handful of hikers going through a stream comparable to the impact of ten bikers splashing across at speed. All trail users affect the trail surface and surrounding environment, especially when trails are poorly planned and constructed. The impacts are intensified when trail activities occur during fragile environmental times - such as when natural surface trails are soft (winter freeze thaw cycle, heavy or prolonged rain events). Soft trails are more susceptible to soil compaction, displacement, and erosion, or vegetation loss or trampling when users avoid puddles or soft tread areas.

The increase of knowledge and understanding of the inner workings of the natural environment and how trail activities impact and interact with local site conditions, has reshaped how the Division approaches trail planning/design, development, and maintenance. It has been the accumulation, and continuation, of this knowledge that has led to a broader and more in-depth approach to the planning process.

The basic principles of sustainable trails include the following:

- Incorporate contour trail design
- Maximize natural and cultural resource protection
- Support current and future use
- Minimize adverse effects on plant or animal life in the area
- Avoid disruption of the natural hydrology
- Minimize adverse effects on tread surface erosion or displacement
- Minimize future rerouting and long-term or recurring maintenance
- Minimize or eliminate recurring trail maintenance costs.

In essence, greater level of sustainability relates directly to water and user management. Adopting these principles ensures a more accessible and sustainable trail system for the future.

Designing a sustainable trail system requires the analysis and evaluation of the following elements and factors: cultural resources; endangered or sensitive plant and animal species; occurrence and health of native plants and animals; mature growth forests; natural drainage; topography, soils, slope and grade changes; ease of access from control points such as trailheads; user type and volume; and user safety. A sustainable trail system will offer trail users interesting experiences in varying landscapes.

Current research suggests that the most effective way to minimize the environmental effects of trail uses is to build environmentally sustainable trails. A sustainable trail balances many elements including location, expected trail use, construction methods, grade changes (grade reversals) and employing quality construction techniques and material.

Maintaining trails to be sustainable will mean that park operations may need to be conducted differently than had been in the past. Using ATVs or gators instead of trucks to access trails, or small mowers replacing large tractors with brush mowers will minimize impacts to the trail. Park volunteers are enlisted in Trail Patrols to educate visitors and help pick up small branches and other debris. Volunteers also help out by reporting downed tree locations or other unsafe trail conditions or maintenance situations that must be carried out by park staff.

Trail Construction and Maintenance Best Management Practices General Guidelines:

- Obtain permits or notifications first.
- Before beginning any trail construction, install necessary measures to minimize and prevent erosion.
- Stabilizing slopes, creating natural vegetation buffers, diverting runoff from exposed areas, controlling the volume and velocity of runoff, and conveying that runoff away from the construction area all serve to reduce erosion.
- Ensure low environmental impact during construction and maintenance- based on seasonal conditions, soils, slope, and vegetative cover.
- Use the proper size tool for the job.
- Minimize the amount of soil disturbance.
- Construct trails during the dry months when soil saturation and water levels are at their lowest.
- Stabilize trail construction areas.
- Install temporary erosion control measures such as hay bales before construction begins. Keep them in place and maintained during construction and remove them only after the site has been stabilized.
- Trails through wet areas should be avoided or bridged.



Historic Fort Miles (Cape Henlopen State Park)

Appendix D: Natural and Cultural Resources

Natural Environment

Cape Henlopen is the largest of Delaware's state parks and it contains a wide diversity of ecosystems including: upland and forested wetlands, freshwater wetlands, tidal saltmarsh, interdunal wetlands, bay and ocean beach and dunes, intertidal flats and early successional shrublands. These provide habitat for a wide range of both common and rare natural plant communities and native plants and animals.

Most of the upland area of Cape Henlopen State Park east of the Lewes-Rehoboth Canal is characterized by a substrate dominated by loose sand that is easily shaped by the dynamic forces of wind, waves, tides and currents. While the natural communities and native plants and animals of Cape Henlopen's coastal ecosystems are well-adapted to thrive under these dynamic forces, they are often poorly adapted to human disturbance. The dynamic nature of the environment also poses challenges to the trail planning process.

As noted elsewhere in this plan, trails can be sources of erosion, compaction and of habitat division and disturbance. But the greatest impacts of trails upon the park's natural resources are as avenues of incursion for non-native invasive plant species into native habitats. This occurs because of the constant soil disturbance and exposure that is typical of even lightly used trails. The passing of humans, no matter whether by foot, horse, bike or maintenance vehicle, is a persistent source of seed dispersal of some of the most highly invasive plants in Delaware's forested landscapes. These plants are not just a nuisance; they can alter and degrade the local ecology. Even the cocoons (containing eggs) of invasive earthworms can be moved this way. Introduction of these invasive plants and animals are the greatest threat to intact native forest habitat throughout our park system. Regular annual monitoring (and treatment if required) is necessary along all trails: existing and abandoned.

Cultural Landscape

Although archaeologists are not yet certain exactly when the first human occupation of Delaware took place, we can say with certainty that people were living in the area 12,000 years ago. These earliest inhabitants fished, hunted large game such as mastodons, mammoths, and other Pleistocene megafauna, and gathered plant foods – all linked to resource availability. During this early period until the Historic Period, the ecotone between the streams or wetland and the forests provided an attractive setting for game and a variety of food plants. It was in these areas during prehistoric times where small bands would have camped for short periods, especially in sheltered forested locations overlooking low order streams or tidal wetlands.

It now appears that maize agriculture was never an important focus for the prehistoric peoples of the Delmarva, unlike along the large rivers further inland. However, multi-family groups occupied seasonal camps allowing them to more fully exploit native foods, thus increasing the likelihood of evidence left behind. The biggest change occurred during the Historic Period.

Historically, Cape Henlopen was one of the first lands in the New World to be set aside for public use, William Penn so decreeing in 1682. The shifting sands at the mouth of Delaware Bay became hazardous to ships, and in 1769 the Cape Lighthouse was completed (now fallen into the ocean). The strategic significance of the Cape became increasingly apparent with the federal government taking ownership of parts of the Cape beginning in the late 19th century. A quarantine station was established on the Bay side of the Cape in 1884, later to become a Naval Station during World War I. World War 2 brought construction of Ft Miles to guard the Delaware, and later a naval submarine warfare center. Today, the state park offers beach, trail, camping, and other recreation opportunities steeped in nature and history to its visitors.

[Appendix E: Public Demand for Trail Opportunities](#)

Trail-related activities are the number one outdoor recreation activities in Delaware to fulfill public needs and trends. These findings were documented in the 2018 - 2022 Statewide Comprehensive Outdoor Recreation Plan (SCORP), a 5-year plan outlining both the demand and need for outdoor recreation facilities. The Plan then projects facilities that will fulfill gaps in outdoor recreation opportunities that meet the public's recreational needs.

In August 2011, the Division of Parks and Recreation conducted a telephone survey of Delaware residents to gather information and trends on outdoor recreation patterns and preferences as well as other information on their landscape perception. These findings are the foundation of the SCORP. For purposes of planning and projecting outdoor recreational facility needs, the State was divided into five regions for reporting. Cape Henlopen State Park falls in Region 1. Within Region 1, 84% of telephone survey respondents expected a member of their household to participate in walking or jogging; 59% participate in bicycling; 60% in hiking; 30% in mountain biking; and 23% in horseback riding. Based on a comparison of findings (from the previously published 2013-2018 SCORP), the trend for trail-related activities continues to be popular among the recreating public.

Delaware is home to diverse population centers, landscape types, and varying development patterns, regional variations in outdoor recreation needs are to be expected. However, a common thread in all regions is the need for linear facilities, such as trails, and paved pathways, that accommodate walkers, joggers, hikers, bicyclists and horse riders. These activities ranked high in every region, as well as among different ethnic groups and age categories. Therefore more linear facilities should be constructed to keep pace with the population growth and the public's participation.

The SCORP survey queried participants on several aspects of their recreational lifestyles. When asked why they participate in outdoor recreation, telephone survey respondents gave these top four answers: 1) for physical fitness, 2) for relaxation, 3) to be with family and friends, 4) to be close to nature and, 5) for mental well-being.

[Appendix F: Minimizing Resource Impacts Utilizing Sustainable Trail Design](#)

Minimizing impacts on natural and cultural resources is critical. The intersection of recreational trails, trail use, and resource protection leads to the most effective way to minimize impacts-sustainable trail design, construction, and maintenance principles. What is a sustainable trail? Although there are many elements that determine whether a trail is sustainable, there are four main trail goals that help determine how sustainable a trail will be; resistance to erosion; fulfills the user's needs; requires little maintenance; and mitigates conflicts between different users. The more successful one is in meeting these goals, the more sustainable a trail is. By far, the biggest threats to non-paved trail sustainability are erosion and soil compaction and displacement.

Erosion is the natural process by which soil and other material is transported by wind or water. If left unchecked, erosion can quickly cause serious damage to trails and the very resources we are charged to protect. Soil compaction and displacement is a localized issue directly related to trail use that can impact a foot to several feet of trail, but can have devastating effects.

Trail erosion and soil compaction and displacement can be accelerated by seasonal conditions, weather patterns, trail use, use volume, use type, terrain, vegetative cover, and gravity to name a few. Depending on the combination of the listed conditions above, tread material susceptibility will vary. However, one can only mitigate trail erosion through the utilization of sustainable trail principles.

Sustainable trail principles work together and when applied will create contour trails that will effectively manage erosion, provide high quality low maintenance trails that are fun to use, and help to reduce environmental impact, risk, and user conflicts. The main two goals of these principles are to manage water and users. Success is measured by keeping water off the trail and users on the trail. The following is a list of the main principles of trail sustainability.

Trail Sustainability Elements

- Trail location: along hillsides or on flat well-draining soils are best
- Trail alignment: along contours
- Trail grades: keep grades 10% or less on average on steep terrain
- Grade reversals: incorporate *frequent* drainage throughout trail system
- Outslope: slope tread toward downhill side to encourage sheet flow across trail
- Adaptive trail design: consider trail design change as soil texture, vegetation cover and other site characteristics change
- Minimize soil displacement: design must take into account type of users
- Prevent user created trails: close all unofficial trail created by users
- Maintain trails: perform regular maintenance

Trail layout and design must take into account the natural and cultural resources of the site. The highest quality habitats and sensitive cultural sites should be avoided to minimize the impact of trail construction on rare species and habitats and archaeological sites. As recreational demands continue to increase, sustainable trail design and construction are critical for the protection of natural and cultural resources. Whenever possible, locating trails on well-drained soils will keep the surface dry, firm and stable. Evaluating impacts is ongoing especially in high quality areas.

[Appendix G: 2016-2018 Public Participation and Analysis](#)

The Division began the public participation process with a series of trail user stakeholder meetings starting in 2016. Comments from the trail user community, advisory councils and public agencies were valuable in shaping the Trail Plan. In total there were 8 field visits with park staff, 8 Division Trail Team meetings, 6 stakeholder meetings (includes internal and external members and covered all the trail user groups and several Councils), and one public open house in April of 2018.

Comments from the trail user community, advisory councils and public agencies were valuable in shaping this trail plan. Use of the Delaware's government web site for posting planning maps, information, and announcements made information more widely available for public review. On April 19, 2018, a public Open House was held at the DNREC building in Lewes on Pilottown Road to review the concept plan. Fifty nine people attended the Open House

Following each user group stakeholder meeting and the 2018 Open House master planning events and comment period, the Division's evaluated all public comments related to trails and to consider the following:

- How comments met the [Trail Plan objectives](#)
- How comments fit into a larger regional trail system
- How potential recreational alternatives might contribute to regional recreation diversity
- How opportunities can be linked to larger trail systems.

Below is the public comment form. Limited feedback for some questions did not provide enough data for analysis but are included to provide a full record.

Cape Henlopen State Park Proposed Trail Plan

Open House - - March 21, 2018 Comment Form

In developing the proposed Trail Plan for Cape Henlopen State Park, the Division of Parks & Recreation has established objectives, evaluated natural and cultural resources, assessed current trail conditions, and weighed constraints and opportunities. You are invited to share observations, insights and comments on the proposed Trail Plan. The Division will further evaluate alternatives for long-term development, management, sustainability and accessibility of Cape Henlopen's trails for current and potential new users as an integral part of a larger regional trail system. Comments you provide will be carefully assessed and evaluated in finalizing a trail plan for the park.

1. How often do you use the trails at Cape Henlopen State Park? (circle one)

Daily Weekly Monthly Few times per year Never

2. How often do you use trails other than at Cape Henlopen? (circle one)

Daily Weekly Monthly Few times per year Never

3. What is your primary trails use? (Primary =1 Secondary =2)

Walking Running Bicycling
 Mountain Biking Dog walking Wildlife observation/bird watching

4. What trail amenities do you use most often? (Primary =1 Secondary =2, etc.)

Information boards Maps Trail markers
 Interpretive panels Restrooms Benches

5. Are there trail amenities that you would like to see added to the Cape Henlopen trail system? Please list and describe where you would like to see them.

6. Are there trail connections or segments that should be added or eliminated from the Cape Henlopen trail system?

7. Please indicate your level of support for the proposed Cape Henlopen Trail Plan. (circle one)

Strongly Support Moderately Support Neutral Do Not Support

8. Do you have additional comments?

Please provide your zip code: _____

Please provide an email if you would like trail planning updates: _____

Visit the project website destateparks.com/Cape-Henlopen-Trail-Plan

Return Comments by April 30th 2018 to:

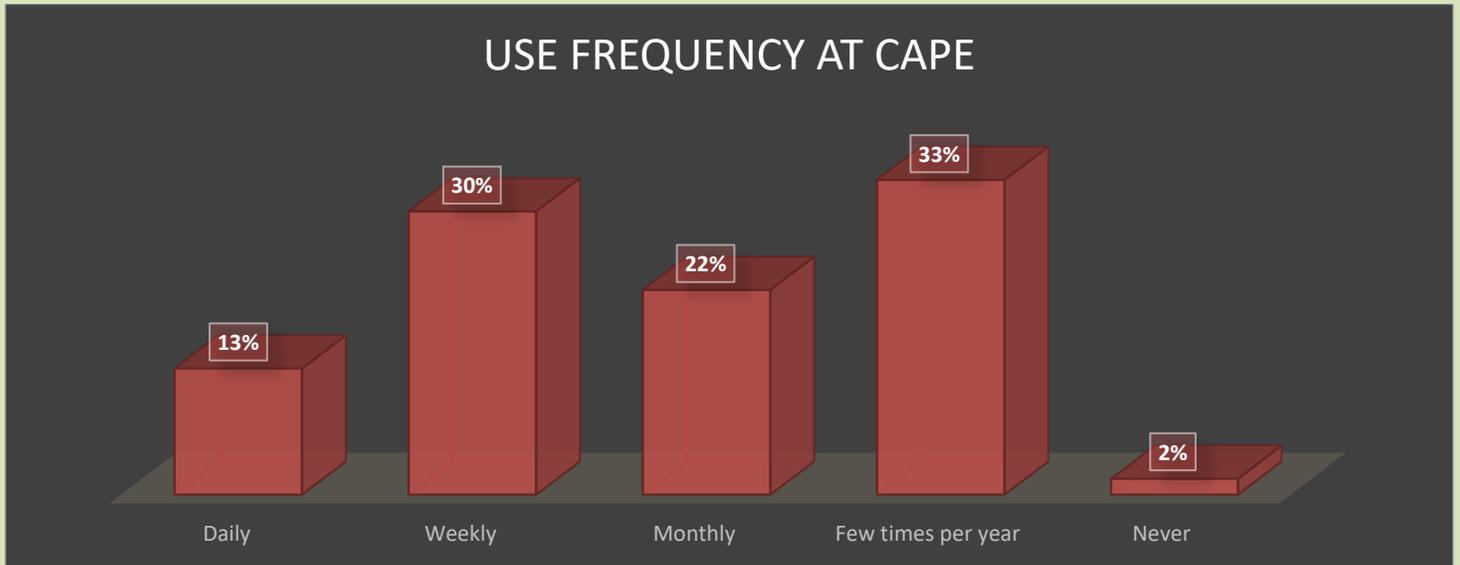
Park Resource Office
Division of Parks & Recreation
89 Kings Highway
Dover, DE 19901
Attn: David Bartoo

Results from the Online Survey

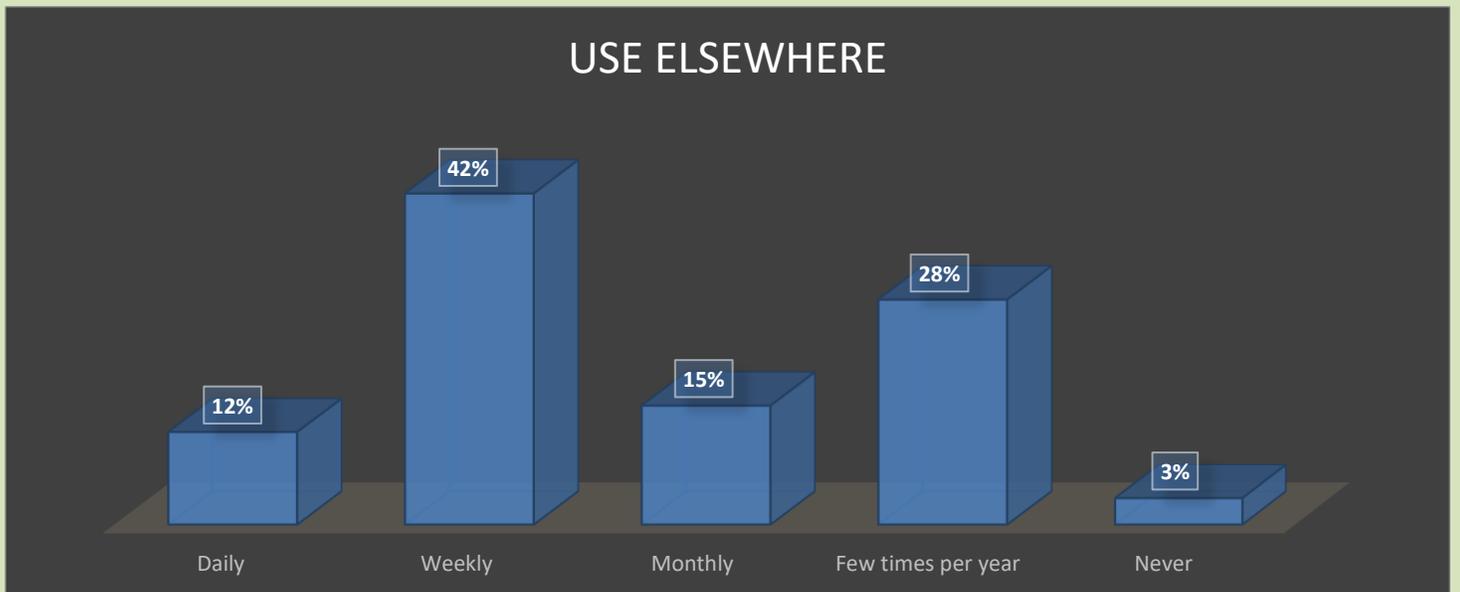
April 2018
62 Completed Surveys

This document presents data that has been compiled and generalized or categorized to protect the confidentiality and anonymity of respondents. Individual responses are intentionally not presented.

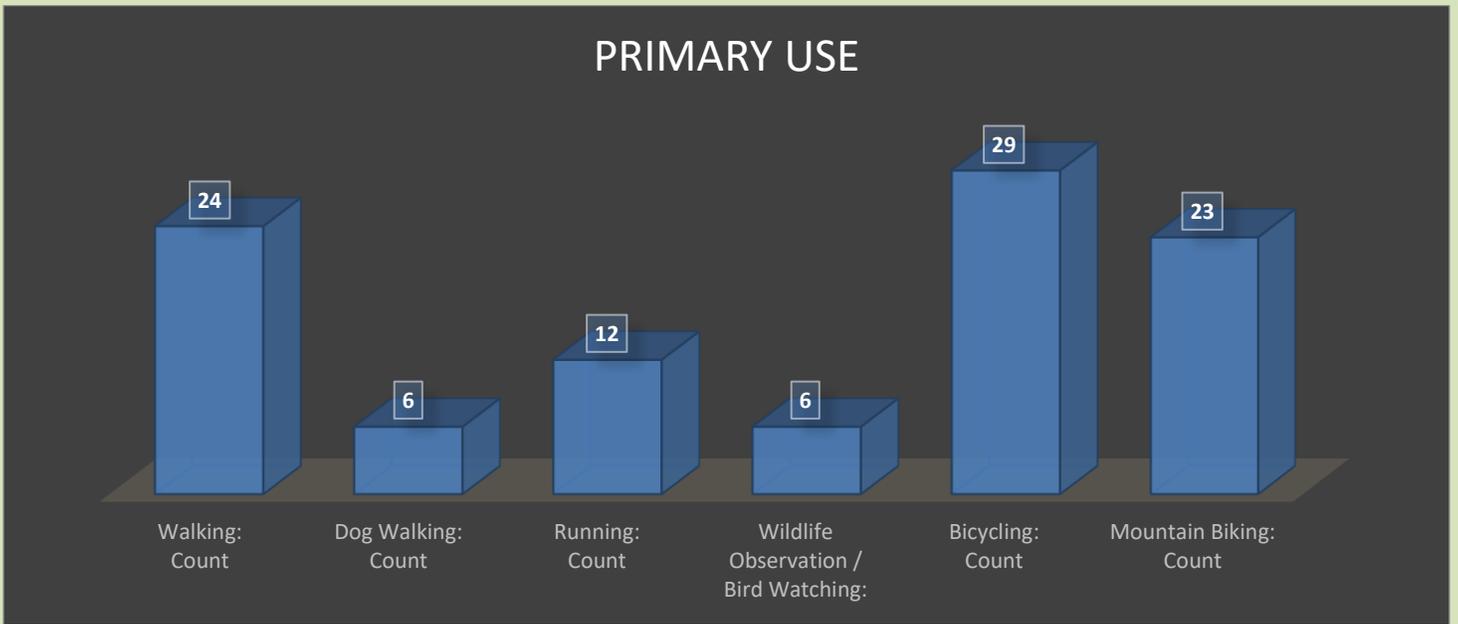
1. How often do you use the trails at Cape Henlopen State Park?



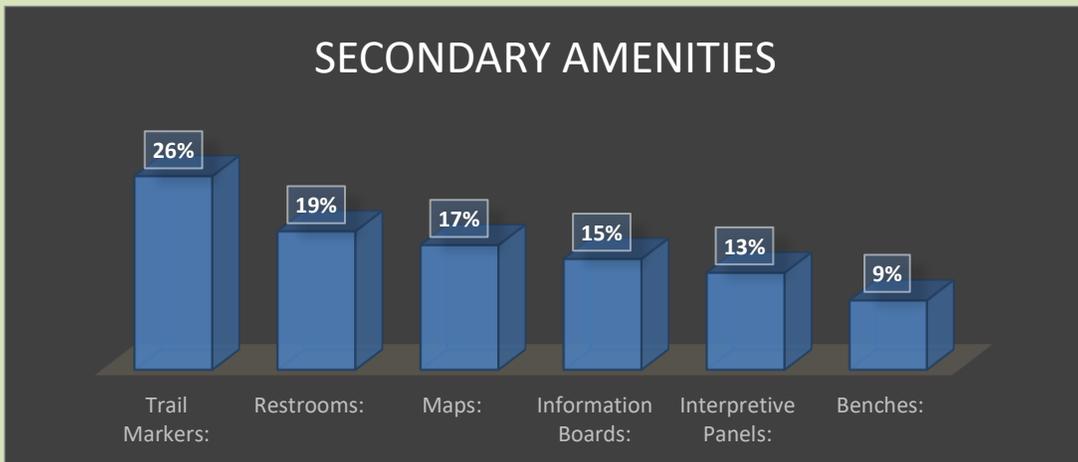
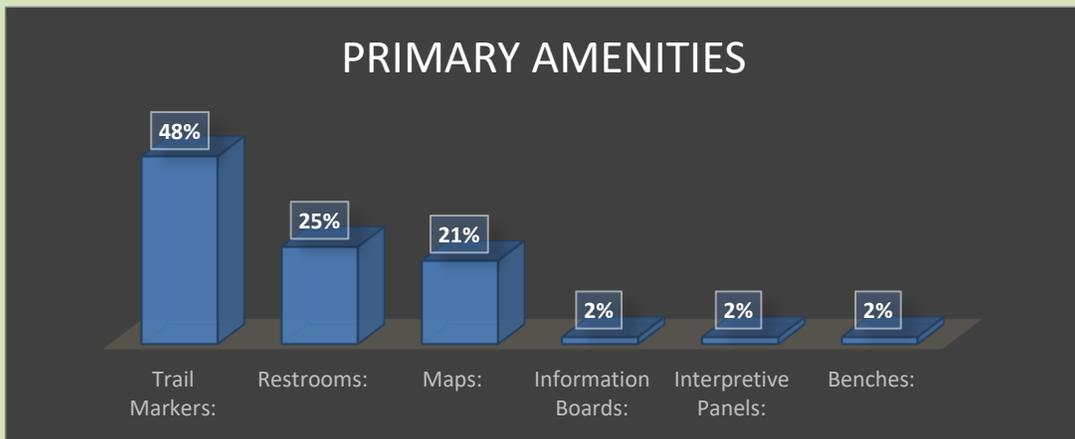
2. How often do you use trails other than at Cape Henlopen?



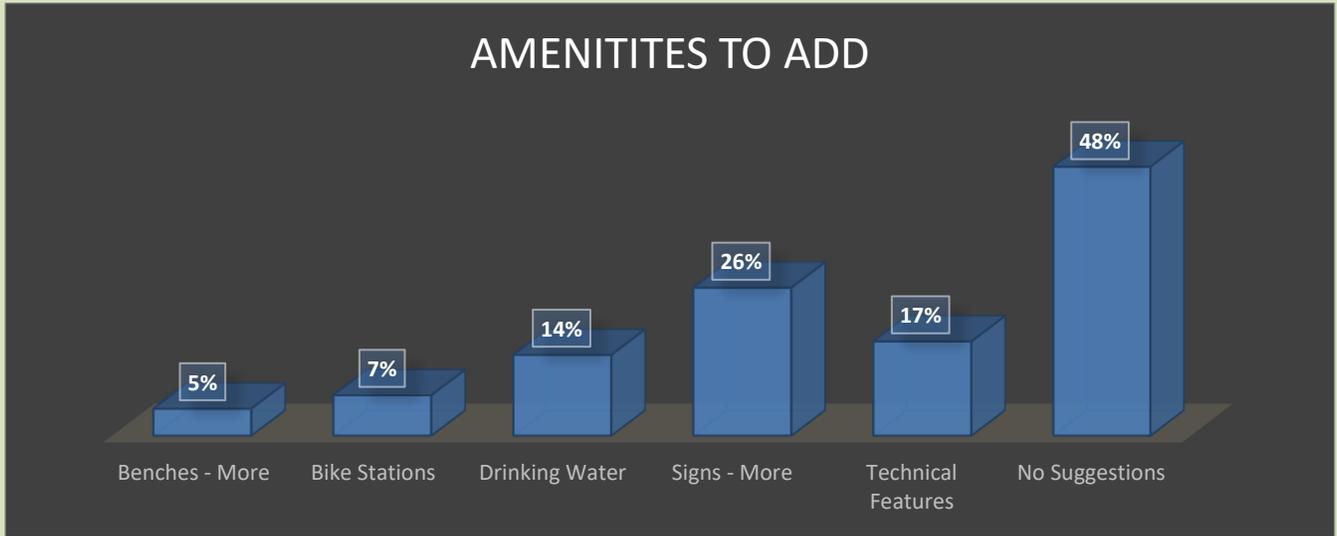
3. What is your primary trails use?



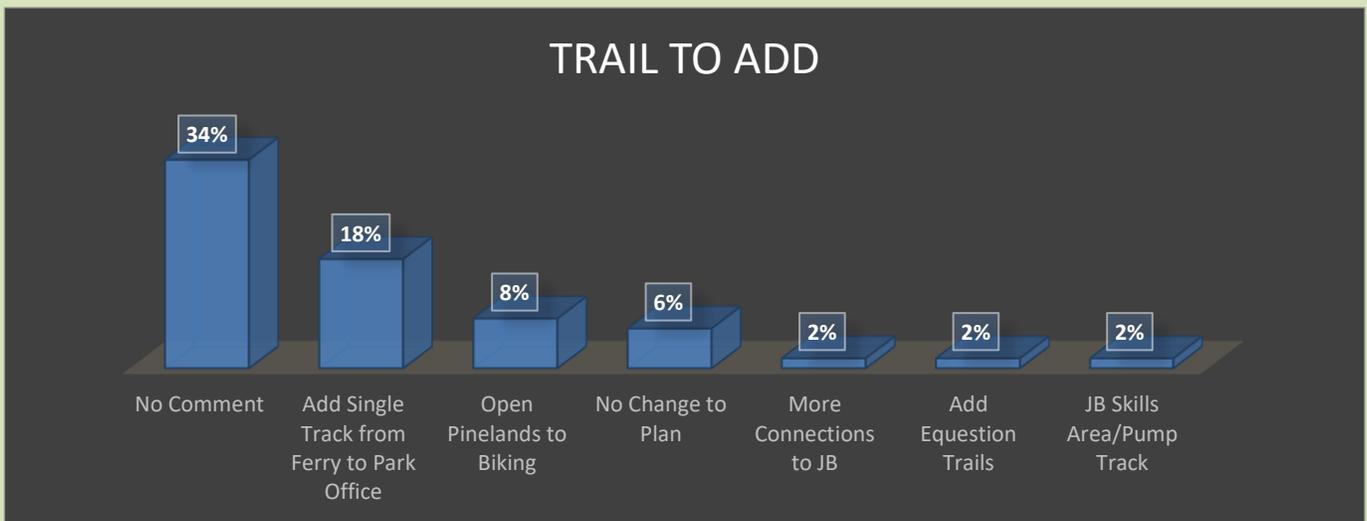
4. What trail amenities do you use most often?



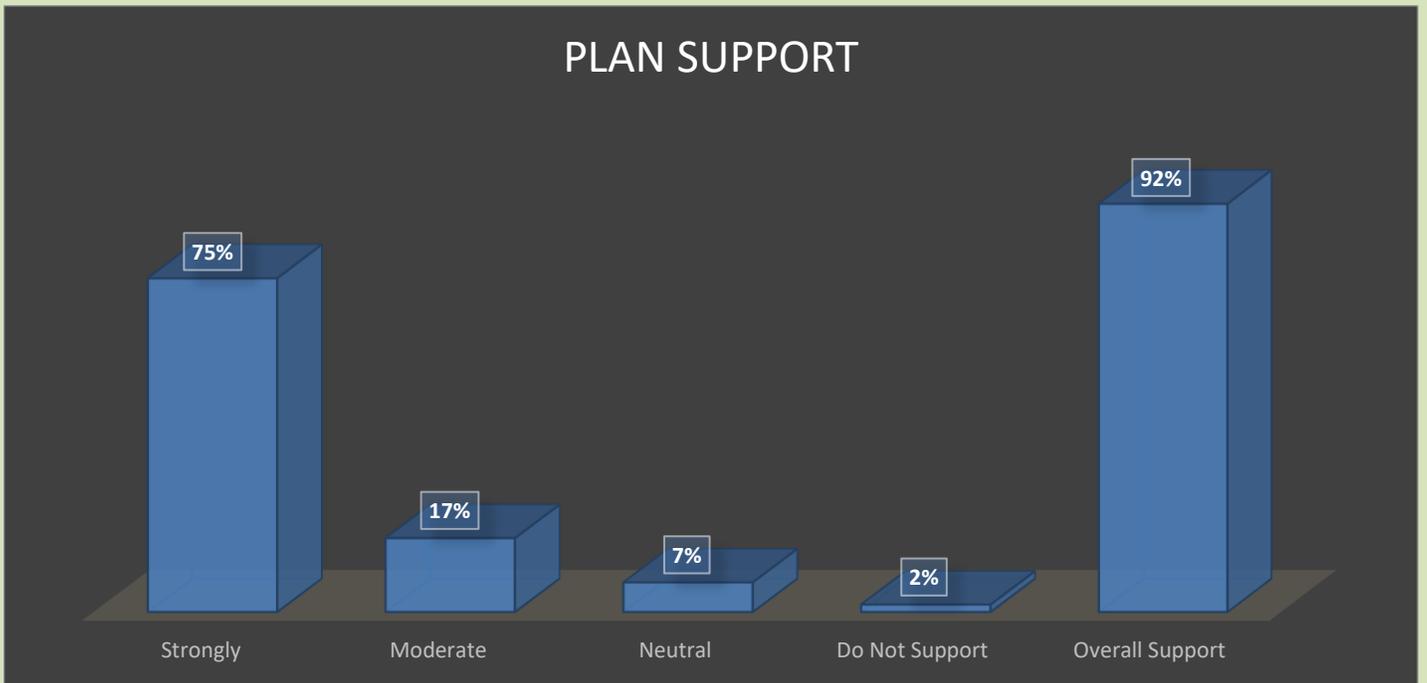
5. Are there trail amenities that you would like to see added to the Cape Henlopen trail system? Please list and describe where you would like to see them.



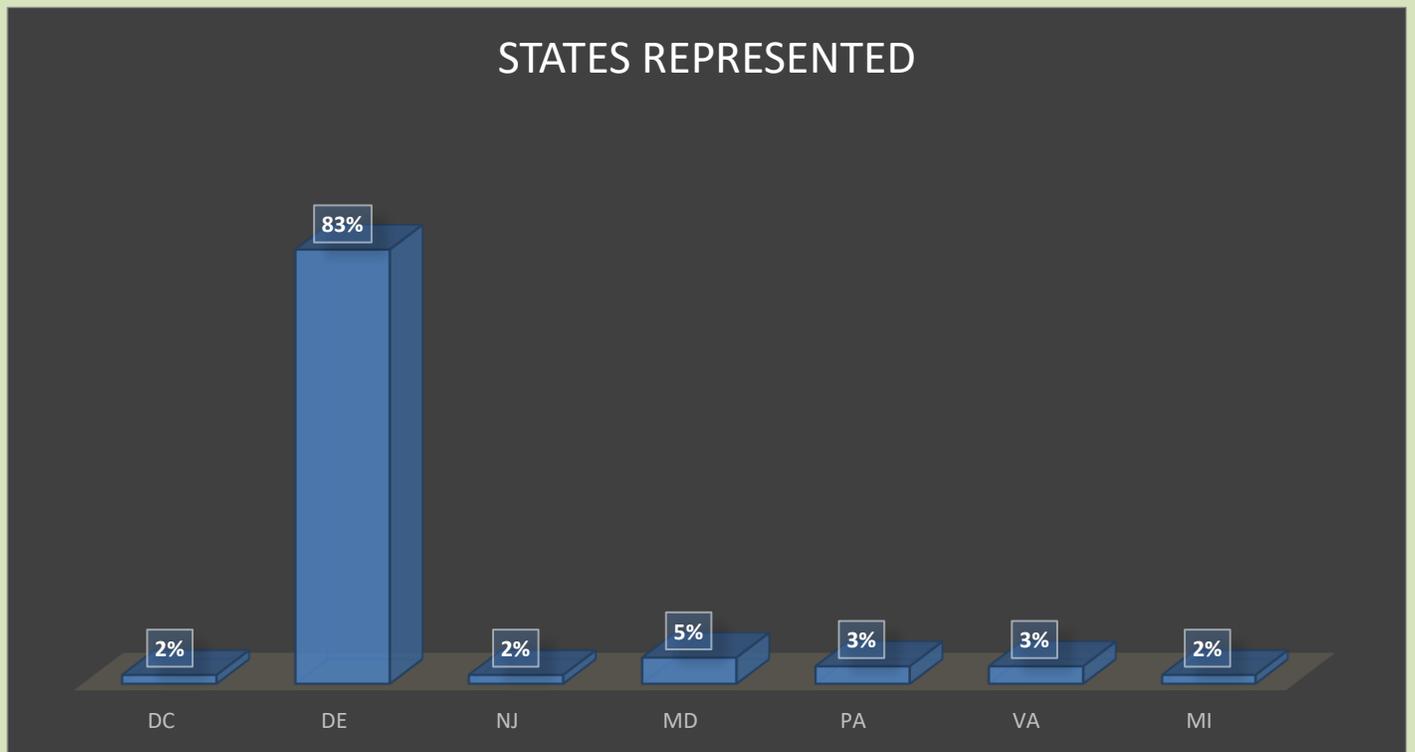
6. Are there trail connections or segments that should be added or eliminated from the Cape Henlopen trail system?



7. Please indicate your level of support for the proposed Cape Henlopen Trail Plan.



8. Zip Codes.



Appendix I: Glossary of Terms

Accessible Trail – A trail that complies with the Americans with Disabilities Act (ADA) and follows federal accessibility guidelines.

Bridge – Structures used to transport trail users over obstacles like ravines, bogs, creeks, or rivers.

Contour Trail – A trail constructed such that it follows a contour or a constant elevation.

Double-Track Trail – A trail wide enough to easily allow passing or allow trail users to recreate side by side: wider than 36”.

Drainage – Methods of getting water off the trail.

Economic Sustainability – Any trail alignment that supports current and future use as it relates to the cost/benefit of that trail to the public.

Ecoregion – A major ecosystem defined by distinctive geography and receiving uniform solar radiation and moisture

Erosion – The natural process of wearing down and removing rock and soil by wind and water. One of the main processes that impact level of trail sustainability.

Essential Experience – A theme that is critical to the park’s story and shares the natural and cultural importance that makes each park special for visitors. The essential experiences are the landscapes, structures (natural and historic), resources, and interactions within the park that connects with the visitor to evoke passion, care, commitment, and investment to the greater good of the park as a whole, the life of the individual, and future generations to come.

Fall line – Direction water flows downhill (path of least resistance). A trail that runs on the fall line will channel water down the trail.

Geographic Information System – Software system used to display data allowing for the visualization and analyzation of that data.

Geomorphology – The study of the physical features of the surface of the earth and their relation to its geological structures

Global Positioning System (GPS) – a system used to map trails and other infrastructure locations using satellites and portable receivers.

Habitat Fragmentation – The emergence of discontinuities (fragmentation) in a plant or animal’s preferred environment.

Hardening – The manual, mechanical, or chemical action that results in a harder less erosive trail surface

Hydric Soil – Soil that forms under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part

Percent of Grade – The method of measuring how steep a trail or slope is. (10 percent = a rise or fall of 10 feet per 100 linear feet of trail.)

Reroute – new section of trail that replaces and existing section.

Shared Use Trail – Trails that are designed and built for more than one possible user. For example: hikers, bikers and equestrians using one trail.

Single-Track Trail – Trails only wide enough for travel in single file: Usually 12-36” wide.

Single Use Trails – Trails that are designed and built for only one intended user.

Slope – The natural (or created) shape of the land. Change of elevation shown on contour maps. The term is generally used to refer to the hill, not the trail.

Social trails – Unplanned/unauthorized trails developed informally from users and are not recognized or maintained by managing agency.

Social Sustainability – Any trail alignment that supports current and future use as it pertains to the public’s acceptance and use of that trail

Sustainable Trail – Any trail alignment that supports current and future use with minimal impact to the natural resources; does not adversely affect the plant and animal life; recognizes that pruning or removal of certain plant species may be necessary for proper maintenance; produces negligible soil loss or movement; requires little or no rerouting or minimal long-term maintenance.

Tight and Technical – A type of trail design that allows for tight turns, slow speeds, and can take fuller advantage of natural features.

Trail Corridor – Area including the tread and trim zone on either side of the tread.

Trail Construction – Any new trail or trail segment that is not a replacement or a reroute for an existing trail.

Trail Maintenance – Any routine trail work within an existing trail corridor including, but not limited to, filling ruts, holes, and low spots, debarment, nicking, vegetative management, obstacle removal. Also included are more advanced maintenance needs such as trail structure repair or replacement, resurfacing, and repairing any trail section that has been damaged by uprooted trees, erosion, or wet conditions. It also includes reroutes 50' or less that are needed to mitigate any unsustainable or climate related condition such as erosion, wet areas, steep grades, uprooted trees, etc.

Trail Network – A grouping of trail systems on a regional, state, national, or global scale

Trail Reconstruction – Any trail work within an existing trail corridor including, but not limited to, significant rebuilding, enhancing, or modifying unsustainable, failing, severely damaged, or unsafe trail segments. Also included are reroutes exceeding 50' in length needed to mitigate any unsustainable trail condition such as erosion, wet areas, steep grades, etc.

Trail Surface – surface of any given trail. Examples include sand, grass, dirt, stone, asphalt, and concrete.

Trail System – A set of connected Trails

Trail Use – type of recreation use designed or managed for any given trail (such as hiking, biking, equestrian, motorized, etc.).

Trail Width – width of a trail. Designed width often based on location, terrain constraints, and type or volume of use of a trail.

**End
of
Trail**