Contents

1. Objectives and Introduction[RB1]

Design Guidelines Mission Statement: *To promote outdoor recreation through the development and improvement of unpaved non-motorized trails to suit our state's current and future recreational needs.*

This manual has been developed to provide design guidelines for unpaved non-motorized trails for uses such as hiking, bicycling, equestrian and multiple use trails in Florida. Trails are a gateway to nature and provide users with a means of learning about Florida's diverse ecology and natural setting. A successful trail design requires an ability to recognize existing uses and groups, while planning for future recreational needs.

While design criteria vary from organizations at the state and federal level, these guidelines are intended to be a flexible baseline of information to create trails. These guidelines consider Florida's diverse natural environment and ecosystems as an asset and require special consideration under to minimize impact. Additionally, it is the vision of the State of Florida to complete a statewide interconnected system of these trails for Floridians and visitors alike. The subjects listed below provide a general summary of the types of information contained within this document. This document should be used in addition to a collaborative trail design process in conjunction with a professional design and engineering firm. The following list provides a number of important considerations in trail design.

Accessibility – Trails should be designed with access for all in mind, this brief summary of information is related to considerations of those who may not have the abilities of others.

Pre-construction considerations – Identifies some basic characteristics of trails that are required for any trail. This section includes general items that every trail must consider before construction. Additional information on environmental and wildlife protection and cost efficiency are located here.

Trail construction guidelines – This section identifies the types of trails identified in this document, including off-road cycling, equestrian, hiking, and unpaved multiple-use trails.

Wayfinding – Trail wayfinding is one of the most vital components of a well-designed trail. Wayfinding allows the user to understand their place in the wilderness or other unfamiliar areas. Sign and marking typology is provided, along with other posting considerations.

Support facilities – Trails must be designed with amenities to attract and support users of systems, this includes section considers trailheads, rest stops, camping facilities and other amenities.

Crossings – Many times, trails cross barriers, boundaries or other physical spaces where the trail will likely need additional design considerations.

Appendices – There is a substantial amount of information related to unpaved trail development that is not discussed in this document that can be found in the appendices. Information in this section includes a bibliography, glossary and paddling trail considerations.

2. Trail Accessibility[RB2]

Trails and associated facilities should be designed or retrofitted to provide access for all as a key tenant in design. From the outset, trails should be designed with all users in mind. Creating trails that are accessible to a variety of users with differing abilities enhances their outdoor experience by creating opportunities to connect individuals with nature. Once designed and constructed, accurate information about what type of experience the user will face on the trail should be clearly shown to illustrate how persons of different abilities may have different experiences than other persons.

Sometimes, physical or environmental considerations prevents a trail from being designed for users of all abilities from receiving the full trail experience. Trails may or may not be restricted by laws or regulations, which would prohibit certain facilities from being put in place. In this instance, other electronic media can be used to enhance the trail user experience through websites, social media, email or other means. Trail managers can also provide helpful information over the phone or through a visitor's bureau. Post accurate and up-to-date information about the trail surface, optional sensory assistance devices and assistive devices available at the trail or trailhead, Wheelchairs and Power-Driven Mobility Devices Policy and service animal policy, including photos and text describing the trail wherever possible.

When considering trail existing trails and providing an experience for all users, trail design should consider budgetary constraints, improving accessibility, legal requirements, and the natural environment as this could alter the existing trail experience. For example, cultural, natural and historic sites should provide reasonable accommodations and consistent access that preserves the significance of each property's features.

There are numerous laws, regulations and statutes related to the creation of applicable facilities and this document should not be the sole source of consideration in designing a trail. A number of resources are available for more information related to the development of outdoor recreation facilities and providing access for all. Please refer to Title II of the Americans with Disabilities Act (ADA), 2010 ADA Standards for Building, Access Board Outdoor Guidelines and Best Practices for non-Federal Lands. Additional manuals are provided by the US Forest Service, including Best Practices for non-Federal Land, and Trail Accessibility Guidelines (FSTAG). For the most recent copies of manuals related to these guidelines, please directly contact the entities listed above. A list of websites has been provided for convenience, but note that these websites often change and may not be the most recent information.

- Title II of ADA – http://www.access-board.gov/
- 2010 ADA Standards – For buildings http://www.access-board.gov/GuidelinesandStandards
- Access Board Outdoor Guidelines – Best Practices for non-Federal Lands http://www.access-board.gov/RecGuidelines
- Forest Service Trail Accessibility Guidelines (FSTAG) – Best Practice for non-Federal Lands http://www.fs.fed.us/recreation/programs/accessibility/

3. Pre-construction considerations

This section discusses some of the considerations that should be made when designing a trail. First, some subjects related to the overall considerations of a trail are given. Additional topics discussed in this section are related to protecting and enhancing the environment, and placing markings or signs on a trail.

Aesthetics - Stimulate the user's senses by providing a route that includes not only scenic views, but also sounds (streams, waterfalls, etc.), smells (pine, ferns, damp earth, etc.), and things to touch (vegetation, rock formations, water, etc.). Take advantage of scenic vistas for rest stops. Trail design, signage, and amenities should be in keeping with the trail setting and should not detract from the trails' character. For example, wilderness trails should maintain a wilderness look and feel.

Archaeological and Historical Resources – Trails should be designed to minimize, or not impact known and unknown archaeological and historical sites. Instead, interpretation of these sites should be included as an integral part of the trail system. Where feasible, archaeological and historic sites (including ruins, working landscapes and historical landscapes) should be included in trail brochures and maps as points of interest. Contact the Florida Department of State for more information on archaeological and historical resources.

Bridges - Provide bridges, walkways and other crossing facilities where necessary with appropriate safety measures or provide for safe passage.

Community Involvement - Solicit community leadership support for trail development. Promote local involvement with trail planning, construction and maintenance. Promote alliances between various trail user groups in an effort to maximize resources and efforts.

Consultation with Authorities - Consult with Federal, State, Local, and other land management authorities to determine regulations for appropriate trail use.

Contaminated Sites - Do not locate trails on known contaminated sites. Or, remediate sites as necessary to ensure a safe and healthy trail experience. An environmental assessment may help determine if a site is or was contaminated in the past.

Degree of difficulty - Establish the degree of difficulty for each trail and/or portion of the trail as required. The degrees of difficulty are defined as easy, moderate and difficult and should be indicated at the trailhead and included in all trail information.

Electronically friendly – Many trail users now carry a number of devices that empower them with information regarding the trail. A trail that is designed well will also benefit from the incorporation of electronic forms of communication along the trail. This can include the following information:

Mobile friendly website or application – Many trails should have information already available online. A mobile device friendly website or application "app" can empower users to get information without the need for signs or other physical changes in the trail. Trail design should incorporate a discussion on what trail information is accessible on a mobile device.

Quick Response (QR) Codes – Many trails in the state deploy QR Codes to allow users to scan the barcode and retrieve information electronically. This can be used to let a user know their location, find information about nearby services and other relevant facts.

User choice – Some trail users prefer not to utilize technology on trails, opting for an escape from technology in the natural environment. For the purposes of designing a trail, community involvement with user groups is incredibly important to preventing conflicts between users who engage with the environment in different ways. Considerations should be given to both users that decide to use technology and those who do not.

Public Land Use - Utilize public land and rights-of-ways whenever possible to minimize private property acquisition. Check land ownership and ensure proper easements, use permits, licenses and agreements/contracts have been obtained. Consideration should be given to state, regional and local comprehensive plans and land development codes for future trail development.

Rural/Primitive/Low Volume Trails - Rural/primitive/low volume trails should take into consideration accessibility to areas with diverse natural and cultural experiences. These trails tend to experience a low volume of users at any given time, contain few amenities and are usually located away from populated areas.

Trail Linkages - Trail location and routing should encourage connections to other trails throughout the state. Strive for linkages from local to regional to statewide trail systems to provide for trail continuity and long distance users.

Waste Receptacles - Provide trash receptacles at primary and secondary trailheads, picnic areas and campsites. All trail corridors should be subject to a "pack it in, pack it out" policy. All waste recepticles should prevent wildlife from accessing disposed trash to prevent behavioral changes in animals.

Urban/High Volume Trails - Urban/high volume trails should be conveniently connected to residential areas, schools, activity centers, parks, recreational areas, cultural and historical points of interest. Where feasible, plan trails to be utilized as transportation alternatives to motorized use and to promote local commuter, leisure and tourism. Urban/ high volume trails shall accommodate all user types where appropriate and shall comply with the guidelines set forth by the Americans with Disabilities Act (ADA).

Visibility - Provide for clear visibility corresponding to travel speed of trail users, especially at trail intersections, corners and curves.

Cost Efficiency

Materials and Equipment - Use locally obtainable or salvage materials and equipment when possible if trail construction is necessary.

Rehabilitation of Existing Trails - Rehabilitate or upgrade existing trails when possible as an ecological and economical alternative to constructing new trails. Encourage the use of abandoned railroads, easements and other rights-of-ways.

Recycled Materials - Utilize recycled materials wherever appropriate.

Life Cycle Costs - Consider life cycle costs in the selection and use of materials for trail construction.

Environmental and wildlife protection

Access to wildlife – Creating a healthy connection between people in nature provides humans with an understanding of how co-habitation and environmental protection serves human and environmental sustainability. Trails provide humans with the ability to expose an increasingly urban human population to nature. Proper interpretation and education in association with trail use allows users to better understand the necessity of environmental protection.

Air quality & noise - Whenever possible, avoid locating trails in close proximity to areas where air and noise are heavily polluted by other human uses.

Diversity of natural experiences - Locate trails in areas with diverse habitats, ecosystems, landscapes, areas of natural scenic beauty and proximity to water bodies whenever possible. This diversity should provide for a wide range of opportunities and a variety of experiences.

Drainage and topography - Lay out paths that conform to the existing topography and minimize impact to natural drainage. Design trails according to the Department of Environmental Protection's (DEP) regulations. To prevent erosion on trails, water should be diverted using water breaks or bars (at an angle other than 90 degrees to the trail), graded dips, and out sloping. Drainage ditches or culverts may also be needed for cross. Use native vegetation to prevent erosion wherever appropriate and feasible. Trails should be designed to limit cut and fill and take advantage of varied topography that does not restrict travel and maintains natural drainage where possible.

Environmental impacts and sensitive areas - Trails should be developed with an awareness of regulations and environmentally sensitive resources and areas. Planning and construction techniques should minimally impact all lands, wildlife, vegetation and water related features, striving to protect them and promote knowledge of their value. Locate trails to avoid fragmenting large intact habitats and provide spur trails to points of interest. Where a trail crossing of a sensitive ecosystem is necessary, either utilize abandoned roads, railroads and other abandoned corridors, or develop other acceptable alternatives. Trail alignment should follow the natural contours of the landscape and should

avoid being constructed in “Ecotones”. The trail should provide for a variety of trail distances, loops, ecosystems, scenery and degrees of difficulty. [RB3]

Environmental, social and economic impact studies: Trails should be designed to benefit the environmental, social and economic a vicinities established features. Where there is no clear picture, or where required by law, studies may be required to find how a trail negatively and positively impacts other public facilities, activities and transportation.

Location and route[RB4] **-** The location and route of a trail will determine the user experience. People who use users in urban areas will have a substantially different story those who use trails in rural areas. Further, the route of a trail can help to diversify the experience of the trail. A meandering path can be more interesting to some users since it encourages the user to observe many different viewpoints along the trail. The ambiance that is set in trail design is important to varying users, and needs of experience users should be weighed against those with varying abilities and skill sets. A trails location and route can drastically impact the environment and impacts should be considered in design. Additionally, cost efficiency of the location may help a design and implementation team consider the location and route of a trail.

Viewsheds – A viewshed provides a trail user with the ability to observe a certain location and reflect on the area. Common viewsheds are seen overlooking lakes, natural landscapes, urban areas, or other areas of significance. Interpretive signage may be provided at these locations, yet is not required since self-interpretation is common in these areas.

Natural buffers - Preserve or replant native or indigenous vegetation to be used as screens where necessary to buffer trails from surrounding areas and to enhance the trail user’s experience.

Prescribed burns - Consider that prescribed burning in naturally vegetated areas is an acceptable management practice and may temporarily impact trail access.

Sustainability – Trails should be designed in a manner that adapts to the environment around it and sustains itself during times of environmental strife and ecosystem changes.

[RB5]**Wildlife behavior impacts** – Design amenities along the trail with considerations for wildlife. Places where humans recreate or live frequently do not consider negative impacts on wildlife and trail design must consider how trash receptacles, campsites, and other trail related infrastructure can negatively impact wildlife behavior while still ensuring humans on trails are able to safely observe natural areas.

3. Trail construction guidelines

Hiking trails

Hiking trails may be classified into three general categories: Low, Medium and High usage. Hiking trails should be kept to a minimum width in more sensitive, natural and rural settings if the volume of use is projected to be low. Medium and high volume trails should be designed wider and stabilized to prolong the life of the trail. Location and volume of use may require a design standard for high volume use, such as paved and/or natural surface trails through parks, neighborhoods or activity centers. The following trail design specifications are only guidelines.

- **Tread Width**
  - Low volume use.....1 to 2 Feet
  - Medium volume use.....2 to 5 Feet
  - High volume use.....over 5 Feet
- **Horizontal Clearance** - 1 foot minimum on each side of tread. Additional clearance should be provided in hazardous areas (e.g. road crossings, sharp drop offs, tripping hazards).
- **Vertical Clearance** - 8 feet minimum clearance.
- **Grades**
  - Desirable grade.....0 to 10%
  - Maximum grade for extended slope.....10%
  - Maximum grade for shorter slope.....15%
  - Steps/water bars will be needed.....>15%
  - Ramps to bridge/boardwalks.....8%
- **Drainage** - Unpaved trails should be cross- sloped or crowned 2% to 5% per foot where needed to ensure the integrity of the tread. See
- **Surfaces** - Unimproved, unpaved: Natural materials such as indigenous soil, leaf litter, pine straw, mowed grass, wood chips. Improved, unpaved: Gravel, compacted limestone, soil stabilizers crushed shell and graded road base. Consideration should be given to the type of surface used depending on location, cost, expected volume of use and type of users.
- **Length of Hike**
  - Short Hike..... 3 to 5 miles
  - Half-day to One Day Hike..... 6 to 12 miles
  - Overnight Hike.....over 12 miles

Off-road bicycling trails

These guidelines address only those bicycle trails that are unpaved. For information about the construction of paved recreational facilities, please contact The Florida Department of Transportation (FDOT).

- **Tread Width** - 18 inches minimum
- **Horizontal Clearance** - 1 foot minimum on each side of tread. Additional clearance should be provided in hazardous areas (e.g. road crossings, sharp drop offs).
- **Vertical Clearance** - 8 feet minimum (Except to allow for the occasional natural obstruction which enhances the experience, but does not prevent passage)
- **Grades** - 0% to 50% (0% to 5% at approaches to intersections)
- **Drainage** - Unpaved trails should be cross-sloped or crowned 2% to 5% per foot where needed to ensure the integrity of the tread.
- **Surfaces** - Unimproved, unpaved: Natural materials such as indigenous soil, leaf litter, pine straw, mowed grass, wood chips. Improved, unpaved: Gravel, compacted limestone, soil stabilizers crushed shell and graded road base. Consideration should be given to the type of surface used depending on location, cost, expected volume of use and type of users. (Soft sandy soils should not be considered for extended bicycle trails).
- **Length of Ride**
    - Short ride..... 1 to 10 miles
    - Medium ride..... 10 to 40 miles
    - Long ride..... over 40 miles
- **Design Speed** - The speed that a bicyclist travels depends on several factors. Type of bicycle, condition of bicycle, purpose of ride, the surface condition, location of trail, the wind speed and direction, and the condition of the rider. Bicycle trails should be designed for speeds that are appropriate for the particular terrain and topography.
- **Turning Radius** - Urban/high volume bicycle trails should have a 20 foot minimum turning radius. Each trail should consider that the design of trail curvature is dependent on the average speed of the cyclist. Increased speed due to a downhill slope requires a longer radius of curvature. Banking and widening the tread on curves provides increased safety. Wilderness bicycle trails should have a turning radius from 2 to 6 feet. The turning radius may be constrained by natural obstructions such as trees, water, rocks or environmentally sensitive areas.

Equestrian trails

Equestrian trails usually occur on natural and unpaved surfaces and are designed for a horse and rider traveling in single file to achieve a “backwoods experience” and facilitate a closeness with nature. Any site considering equestrian trails should have access to sufficient land to develop or connect to at least five miles of trail. Horse- drawn wagons or carriages are gaining in popularity and usually travel on jeep or two-lane dirt roads where access is available to bridges for crossing creeks and streams. Consideration should be given to identifying appropriate road systems on public lands that could accommodate “driving trails”.

- **Tread Width** - 18 inches minimum
- **Horizontal Clearance** - 2 feet on each side of the tread width. Additional clearance should be provided in hazardous areas (e.g. road crossings, sharp drop offs, tripping hazards).
- **Vertical Clearance** - 10 feet minimum clearance overhead.
- **Grades**

    - Desirable grade.....0% to 10%
    - Maximum grade for extended slope.....18%
    - Maximum grade for shorter slope.....25%
- **Drainage** - Unpaved trails should be cross-sloped or crowned 2% to 5% per foot where needed to ensure the integrity of the tread. See Objective 1.2.12.
- **Surfaces** - Unimproved, unpaved: Natural materials such as indigenous soil, leaf litter, pine straw, mowed grass, wood chips. Improved, unpaved: Compacted limestone, soil stabilizers and graded road base. Consideration should be given to the type of surface used depending on location, cost, expected volume of use and type of users. (Soft sandy soils and gravel should not be considered for extended horse trails).
- **Length of Ride**
    - Short to half-day.....5 to 16 miles
    - Full day.....17 to 32 miles
    - Overnight trip..... Over 32 miles
- **Water:** Access to water should be provided every 5 to 10 miles along trail)

Unpaved Multi-Use Trails

For the purposes of this document multi-use trails are categorized as trail corridors for multiple trail user groups.

- **Trail Corridors** - Single use trails in close proximity to each other with the same geographical location should consider using more than one tread type where appropriate. Refer to specific trail design and construction guidelines for each user group.
- **Unpaved Multi-use Trail** - Unpaved multi-use trail for high volume usage is not recommended. [RB6]
- Unpaved multi-use tread for low and medium volume should be as follows:
    - **Tread Width** - Optimum 5 feet minimum.
    - **Horizontal Clearance** - 1 foot minimum on each side of tread.
    - **Vertical Clearance** - 10 feet minimum.
    - Grades
        - Desirable grade..... 0% to 5%
        - Maximum grade for extended slopes.....10%
        - Maximum grade for shorter slope.....15%
    - **Drainage** - Unpaved trails should be cross- sloped or crowned 2% to 5% per foot where needed to ensure the integrity of the tread. See Objective 1.2.12.
    - **Surfaces** - Unimproved, unpaved: Natural materials such as indigenous soil, leaf litter, pine straw, mowed grass, wood chips. Improved, unpaved: Compacted limestone, soil stabilizers, and graded road base. Consideration should be given to the type of surface used depending on location, cost, expected volume of use and type of users. (Soft sandy soils and gravel should not be considered for extended multi-use trails).
    - **Trip Length** - Will vary according to user type.

Trail crossings [RB7][RB8]

Trail crossings are becoming an increasingly dominant discussion item for multiple types of trails as Florida continues to grow in population. Trails need to respect private property, weigh the cost of an alignment, and ensure the safety of users. All of these tenants relate to how a trail gap can be closed when a physical barrier such as a road, railroad, waterway or other obstruction is present. For any transportation related crossing such as a roadway, railroad, or others please refer to Florida Department of Transportation's Plans Preparations Manual, available at http://www.dot.state.fl.us/. [RB9].

At - Grade Crossings

At-grade crossings occur when a trail needs to cross a non-trail facility without a bridge or tunnel. Whenever it is necessary to cross transportation or utility with a trail, special care must be taken to ensure the safety of trail users and respect for private property. Selection of a safe crossing may take precedence over a scenic route or require the lengthening of the trail to allow for both. Appropriate signs should be installed to warn trail users as well as motorized traffic of the crossing and any dangers or hazards that might be encountered. Clear visibility at crossings is required for all. Adequate stopping sight distance must be provided for motorists and trail users. A trails width should not be reduced as it approaches a crossing. It should also be straight and cross at a right angle to the road or rails. When it is not possible to cross at 90 degrees, the trail should be widened to allow the users to cross as close to 90 degrees as possible.

Equestrian trail crossings at paved roads and railroad tracks should have enough cleared space on both sides of the road or track to allow a reasonable number of riders to gather in a group and cross together. On equestrian trails, a ford through the water may be used for crossing a waterway that is less than 30 inches deep, where approach is gentle and stream bottom is firm. Avoid fording areas where erosion and resource damage may occur. Water level indicators are required at all fords.

Above-Grade Crossings

Constructing a bridge for a trail over a transportation facility, waterway, or other piece of land preventing a trail connection often substantially increases a projects cost and should be weighed against the cost of finding an alternative route to close a gap in trail. Bridges should be constructed above the seasonal high water mark. In places where minor connections are necessary such as waterways, topographically challenging areas, and other places, bridges and boardwalks can be used.

Water Crossings

When crossing over paddling trails, allow for a minimum of four (4) feet of vertical clearance under the bridge at the seasonal high water mark. Bridges with an elevation of over 36" above grade or swift moving water shall have railings at a minimum height of 42 inches. [RB10]

Fence, Gate and Barricade Crossings

Trails often cross property boundaries. Where the trail meets a fence that must remain intact, a fence crossing or stile is needed. Gates which must be opened and closed should have signs to remind trail users of their responsibility to close gates after use or should be equipped with an automatic closer, however, this situation should be avoided where ever possible. Barricades should be installed to prevent unauthorized users from entering a trail. They should allow for unrestricted access by the appropriate trail user, as well as controlled access for emergency, maintenance and patrol vehicles.

Fence and Gate - If a permanent pedestrian opening cannot be negotiated through a fenced area, then a gate should be installed with a sign to trail users to be sure to close gate behind them or with instructions about who to contact if it must be kept locked. Another standard that may be used is a self-closing hinge on a gate that will automatically close due to a spring mechanism in the hinge. Fences maintaining livestock in a field or pasture can be fitted with a pedestrian baffle or a stepladder crossing (stile).

Barricades - Barricades are usually used to prohibit motorized vehicles from trails or to separate one trail use from another. Signs should accompany the barricade explaining what is expected so that intentions are clear and enforcement is easy. Barricades should allow for unrestricted access by pedestrians, equestrians and cyclists as well as controlled access for emergency, maintenance and patrol vehicles. Wooden or reinforced concrete posts should be 24 inches to 30 inches in height and placed 4 feet to 5 feet apart and be marked with a readily visible reflective or painted surface.

4. Wayfinding[RB11]

Signage provides trail users with information they need to use trails and trail facilities. Trail signs need to be carefully designed and appropriately installed according to type and level of use expected. However, trail users and managers should avoid over signing, which can clutter the environment, resulting in information overload and often to trail users beginning to ignore regularly posted information. Signs must be clear, concise and legible. Their location and placement is critical.

Emergency indicators– Signs indicating what to do in case of emergencies should be placed at trailheads and along trails. This includes information on how to interpret a user's location and a description of what the sign is saying. Trail design should incorporate a unified emergency demarcation system that is developed in collaboration with the emergency response services such as police, fire, and EMT.

Maps – Provide signs, maps and brochures at all trailheads, information kiosks appropriately placed along the trail, to indicate permitted type of trail use, and to inform trail users how far they have traveled, trail difficulty rating and their approximate location on the trail. Signs and maps may also make note of such things as landmarks, commonly seen wildlife, unusual features and sites of historical or ecological significance. All signs should be easily identifiable, vandal resistant, weather resistant and durable.

Posting Height – Hiking, Off-Road Bicycling, and Multiple-use marking should be 4 to 6 feet high on poles or posts along the trail, or 5 to 6 feet high on trees along the trail. Equestrian marking should be 4 to 6 feet high on poles or posts along the trail, or 7 to 8 feet high on trees along the trail.

Private Property – Trails often border and sometimes traverse private property. Trail users should respect these boundaries by observing posted signs, exercising caution to avoid trespassing. It is the responsibility of the trail user to know their location, and the managers responsibility to provide information on the trail and trailhead. Information should be provided at kiosks or on trail maps or on route to inform the trail user. Additional information may be provided to mobile devices that employ geolocation technology.

Trail Marking and Location System - Provide a standardized, universally recognized, and easily understandable trail and marking system. This trail marking system should be used at hazardous points and directional changes along the trail.

Types of trail signage and marks

There are four types of signs that are typically provided along trails, Directional, Informational, Regulatory and Festival. Each sign should be clearly indicated to trail users to best orient them and provide them with an overall positive trail experience.

Directional Signs –Informing trail users of their bearing and route of travel is one of the most basic, albeit required types of signs necessary for any trail system. Signs should include a combination of styles to accommodate users of all abilities. For example, a set of shapes that are textured in differing colors can clearly provide users with sight limitations to better orient themselves than just a plainly colored shape. Directional signs should clearly distinguish all primary trail routes from side, access, loop, connector or cross trails and use double blazes or some form of graphic symbol for changes in trail direction.

Informational Signs are used to orient trail users as to their location on or within a trail system, provide an overview of facilities and/or amenities and a description of the route to reach them. Informational signs can also indicate trail length, number of miles traveled (milepost), as well as other information. The material, color, and size of sign used should be consistent within a given trail. Signs may use international adopted symbols for all graphics. ***Designated camping areas should be blazed with 6 inch wide bands painted around trees, poles or posts or marked with a graphic symbol, surrounding the entire boundary of the camping zone.*** [RB12]

Regulatory Signs are used to notify trail user of laws, regulations and rules governing the trail, such as permitted uses, hours of operation or accessibility. Regulatory signage must comply with the agency having jurisdiction over land trail crosses. All regulatory signs should be of black lettering on a white reflective background, unless otherwise directed by the agency having jurisdiction. Check with local authorities for specific regulations. [RB13]

Warning Signs are used to caution trail users about hazards that may be encountered on trails, such as sharp curves in the trail, slippery bridges, roadway crossings, steep downhill or uphill conditions, blind intersections, changes in trail surface conditions and waterway hazards. Warning signs should be of uniform size and placed at a minimum of 50 feet before the hazard and located at the hazard. Warning sign should be of black lettering on a reflective yellow background. Sign should be consistent along the same trail. [RB14]

Educational/Interpretive Signs describe unique natural or cultural features along the trail. Material, color and size should be consistent along the same trail or natural feature.

Festival Signs are used to promote and advertise special activities and event and are designed at the discretion of the trail manager.

Trail Blazes [RB15]**–** Trail blazes are a common type of marking for any particular type of trail. Many trail managers utilize various shapes, sizes and classifications of trail blazes. Blazes should be painted vertically at a minimum of 2 inches wide and 6 inches long. Double Blazes or a sign should be used to indicate a change of direction when the trail is departing from an obvious path. Double blazes should be painted one above the other at 2 inches apart. Blazes or signs should be frequent enough along the trail and indicate the appropriate user type on the correct trail. The distance between blazes will vary with terrain or water body. The trail must be blazed or signed so it can be followed in either direction.

Camping Blazes or Signs [RB16]– Designate camping areas with 6 inch wide bands painted around trees, poles or posts surrounding the camping area. Designated camping areas may be signed on trees, poles or posts surrounding the camping area.

Graphic Symbols - Each trail system may have different graphic symbols with different meanings. For example, an international association publishes standards for mountain biking, while hiking groups have largely adopted a blaze system. Graphic symbols indicate to trail users information about a trail sections level of difficulty, directions, warnings and other information.

Attachment methods – There are many ways to affix signs or marks along trails to indicate to user's relevant information regarding their trail experience. The way a sign or mark is placed on a trail or other fixture such as a tree or post can affect a user's experience. Generally, the most common practices of affixing signs and marks along trails are to paint onto tree surfaces, nail to a post or a tree with an aluminum nail, or to use a post that is buried at a minimum of two feet deep with a cross member at the bottom of the post for stability.

5. Support facilities

Support facilities consisting of trailheads, parking and staging areas are necessary to the function, management, accessibility and safety of trails. Not all trails are required to have a primary or secondary trailhead. Location and layout of support facilities should be designed uniformly with sensitivity to the environment, should accommodate users and should be constructed in compliance with ADA guidelines.

Trailheads – A point of access or starting place of a trail system. A trailhead will function as a location for information about the trail. Trailheads are classified into three categories: Primary, Secondary and Remote, and should include provisions as a minimum:

- Primary Trailhead consists of improved parking areas, public telephone, sanitary facilities, information and interpretive signs, maps and brochures, potable water, picnic facilities, electric service, direct access by management personnel and other amenities.
- Secondary Trailhead consists of unimproved parking areas, sanitary facilities, information signs, maps or brochures, potable water and access by management personnel.
- Remote Trailhead consists of an unimproved parking area, bench information signs, maps or brochures and access by management personnel. [RB17][RB18][RB19]

Rest stops – A designated place to stop along a trail. A rest stop may consist of, as a minimum, a bench placed in the shade or with a roof structure. Consider issues such as surveillance, security & distance when planning rest stop.

Parking and staging areas – It is important to consider the average and maximum user capacity of a trail when planning parking needs. Parking lots should be sized consistent with the use demands, trail activity, and user type. Minimum parking for 25 vehicles should be provided at primary trailheads and may be extended to 100 spaces. Parking lots must provide adequate space for vehicles with trailers and include the proper turning radii. Staging areas at trailheads should be located with convenient and safe access to the trail.

- **General Parking** - Follow FDOT guidelines. [RB20]
- **Equestrian Trailer Parking** - Should be non-asphalt and designed as a row of pull-through spaces each 45 feet deep and 15 feet wide for unloading horses and to allow horses to be tied to trailer sides. To accommodate overflow parking, additional space is recommended. When designing for equestrian parking consider accessibility to shade and potable water.
- **Bicycle Racks** - Racks should be provided at all primary trailheads. They should meet context sensitive design guidelines in be located in suitable staging areas.

Camping

Where desired, permitted and appropriate, provide for camping as follows:

- **Primitive Camping** - zones shall contain minimal amenities and be in remote areas. Primitive campgrounds should be accessible only by foot, hoof, bicycle, or canoe. The campsite should be screened from the main trail. Clearly define the camping zone with signs. Design should consider the lay of the land, with level, normally dry forested areas preferred. Campsites located within various public agency lands shall comply with those agency regulations. Provide vertical, open space for tents and horse areas. All primitive camping should be under the "pack it in-pack it out" policy.
  - Hiking, Bicycling Camping - Provide space to be used as designated camping areas. Area needs to be well defined.
  - Equestrian Camping - Provide an area in close proximity to camping area for tying or tether lines for horses. Area needs to be well defined.
- **Location** - Camping zones should be designated a short distance off the main trail and well marked.
- **Space Standard** - Where appropriate land is available, provide a minimum of 1 acre (8 to 10 campsites) as a designated camping zone. If possible, provide multiple sites appropriately spaced. Larger areas should be designated for trails with greater use. Equestrian camping zones will require a minimum of 2 acres (8 to 10 campsites) for camping and horse accommodations.
- **Amenities** - Suggest fire pits or fire rings where permitted. Consideration should be given when choosing areas for camping, where natural water systems are located for potential sources of drinking and cooking water.
- **Developed / Group camping**: Developed camping should contain amenities. The campsite should be screened from the main trail. Clearly define the camping zone with signs. Design should consider the lay of the land, with level, normally dry forested areas preferred. Camp- sites located within various public agency lands shall comply with those agency regulations. Provide vertical, open space for tents and horse areas.
  - **Location** - Camping zones should be designated off the main trail at a short distance. Access by management and emergency vehicles shall be designed.
  - **Space Guidelines** - Developed camping areas should be designed with space available for use by all user groups. Campsites should be built to accommodate travel trailers, motor homes, horse trailers, canoe trailers. Equestrians, bicyclists and canoeists will require additional space for racks, stalls, corral, wash down areas, hitching posts, trailer parking.
  - **Amenities** - Types of amenities may include electrical hookups, water hookups, designated and numbered sites, trailer dump station, refuse station, restroom with showers, picnic tables, fire rings, security, pavilions, cabins, concessions, docks firewood, stables, corrals and access by management personnel.

Appendix A: Glossary of Terms

TERMS USED IN THE TRAIL GUIDELINES DOCUMENT

Amenities - Any element used to enhance the user's experience and comfort.

Above-grade crossing –

At-grade crossing -

Debris - Any undesirable material that encroaches on a trail that hinders the intended use.

Ecotone - Transition zone between 2 plant communities.

Guardrail - A protective barrier placed along hazardous sections of a trail.

Interpretive Sign or Display - An educational sign or display that describes and explains a natural or cultural point of interest on or along the trail.

Kiosk - A structure housing informational or interpretive displays.

Multi-use Trail - A non-motorized trail shared by more than one user group.

Off Road Bicycle/ Bike - A term used to define the non-motorized bicycle ridden on unpaved trails. Synonymous terms include: Fat Tire Bike, All Terrain Bicycle (ATB) and Mountain Bike.

Staging Area - A short term parking area located within close proximity to the trail for off landing gear.

•**Portage - Use hiking trail guidelines for land based portage trails. Trail Degree of Difficulty Rating** - A rating of trail difficulty based on an average user with average physical abilities.

- Easy is defined as relaxing, posing minimal difficulties and able to be traveled with little physical effort.
- Moderate is defined as not requiring excessive or extreme physical effort.
- Difficult is defined as physically strenuous requiring excessive or extreme physical effort.

Wetland - a lowland area, such as a marsh or swamp, that is saturated with water, creating a unique naturally occurring habitat for plants and wildlife. [RB21]

Appendix B: Paddling Trail Considerations

This document is created for the purposes of land based, unpaved trails. Nevertheless, information related to the creation of paddling trails can increase exposure to natural lands and considerations should be given to the design of these trails. Publically owned waterways are can possess scenic and recreational qualities, increasing exposure to wildlife. Florida has a great diversity of waterways systems suitable for paddling trails. These include rivers, creeks, lakes, estuaries and coastlines, including all waters of the state. Paddling trails shall comply with state and federal regulations of the U.S. Coast Guard and Florida Fish and Wildlife Commission (FWC). Contact the FWC for an in-water informational signage installation permit.

- **Camping** - Where no dry land is available along paddling trails, a covered platform may be provided above the high water mark. Provide a self-contained or equivalent restroom facility. [RB22]
- **Water Depth** - Except for periods of extreme drought, paddling trails should be a minimum depth of 6 inches.
- **Portage** - Use hiking trail guidelines for land based portage trails.
- **Trip Length**
    - Short to half day..... 2 - 8 miles
    - Full day..... 8 - 15 miles
    - Overnight..... Over 15 miles [RB23]
- **Land-based signage –** Signs placed on waterway banks shall be visible at varying water levels by the paddlers and should follow the attachment methods in II.D. 1 through 3a.
- **In-Water informational signage** – Review by the U.S. Coast Guard and the U.S. Army Corps of Engineers has to be completed. The following conditions have been approved for use as described below.
    - Signs placed in Florida waterways require a permit and shall comply with U.S. Coast Guard and FWC regulations. Contact the FWC for installation permit.
    - Markers/signs shall only be placed on one side of the paddling trail. Markers/signs shall be placed on shore or as close as possible to the shoreline, so as not to be mistaken for navigational aids.
    - Markers/signs shall be placed out of the “main” body of water so as not to become a hazard to navigation and/or safety for powered boats.
    - Markers/signs shall be a minimum of 12 inches by 12 inches and a maximum of 18 inches by 18 inches.
    - Markers/signs material shall be white reflective background with an international orange border, black block characters and brown crossed kayak and canoe paddles. (To be utilized on signs only.)
    - Markers/signs to be mounted on min. schedule 40 PVC pipe, 4 inches in diameter.
    - Pile markers/signs are recommended in areas where facilities are not available, or it is not possible to install the larger signage. Utilize min. schedule 40 PVC pipe, min. 6 inches in diameter. Markings on the pile markers/signs shall be white reflective background with an international orange border, black block characters and brown crossed kayak

and canoe paddles. [RB24]

- Water Crossings
    - When crossing over paddling trails, allow for a minimum of four (4) feet of vertical clearance under the bridge at the seasonal high water mark. Bridges with an elevation of over 36" above grade or swift moving water shall have railings at a minimum height of 42 inches.

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Appendix C: Bibliography of Trail Information

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