



Appendix E

Florida Greenways and Trails System design guidelines for unpaved and paddling trails

*Developed by the
Florida Recreational Trails Council
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Introduction

In 1987, the Florida Legislature established the Florida Recreational Trails System under Chapter 260, Florida Statutes. The intent of the Legislature was that the “recreational trails will serve to encourage horseback riding, hiking, bicycling, canoeing, and jogging and thereby improve the health and welfare of the people.” The Department of Natural Resources, Division of Recreation and Parks, was given direction under Chapter 260.016, Florida Statutes, to establish the Florida Recreational Trails Council (Council) which “shall advise the division in the execution of its powers and duties under this chapter.” This 26 member body is comprised of representatives from various recreational user groups; private landowners; as well as local, state, and federal government. The Council’s primary role would be to provide a forum for discussion of trails issues between the trail users and trail providers. At its first “working” meeting, held in November of 1988, the members agreed after much discussion, that there was a definite need for a formally recognized set of trail development and maintenance standards suitable for Florida’s natural environment. The Council immediately set out to create these standards.

The 10 years to follow would not always be easy for this Council. The merging of the Department of Natural Resources and the Department of Environmental Regulation in 1992, created the Department of Environmental Protection as we know it today. In 1994, just as things were settling down from the merger, the responsibility of the Council was transferred to the Office of Greenways and Trails from the Division of Recreation and Parks. Even though the Council had new faces to learn and new rules to follow,

they continued with the development of the trail standards as one of their top priorities. After years of research and input from many groups the idea of creating trail standards evolved into this working document, *The Florida Greenways and Trails System - Design Guidelines for Unpaved and Paddling Trails*. This document is meant to serve strictly as a guideline for the design and development of unpaved trails and should be adapted to local environmental and site conditions.

The members of the Florida Recreational Trails Council’s sub-committee who dedicated many long hours and weekends to the completion of this document should be commended for their extraordinary efforts. The Council also owes its gratitude to the staff of the Office of Greenways and Trails for all of their patience and support throughout the development of these guidelines. Thanks are also extended to the Department of Environmental Protection, the Division of Recreation and Parks, and the members of the Florida Greenways Coordinating Council. Our greatest thanks go to the citizens of the State of Florida for their tremendous response to our request for ideas and suggestions. This support has fueled the efforts of the Council as they have worked to develop these guidelines.

1. Design objectives

1.1 Primary goal

The primary goal of this manual is to provide minimum design guidelines for unpaved non-motorized trails for uses such as hiking, jogging, bicycling, horseback riding, paddling, as well as multiple use for trails in Florida. Successful trail development depends upon our ability to recognize existing and future recreational needs in Florida. It is the intent of these design guidelines to assist in the development and improvement of non-motorized trails to suit our state's recreational needs now and in the future.

Design criteria will vary and are intended to be flexible according to the expected volume, type of trail and abilities of the trail users. Besides its diverse user groups, Florida's varied natural environment will require special support facilities under certain conditions to minimize impact. It is imperative that minimum design guidelines are established to promote consistent, safe, environmentally compatible and enjoyable trail development throughout the state. These minimum design guidelines have been developed with the goal of establishing a balanced interconnecting system of recreational trails throughout the state for use by the public.

1.2 Objectives

- 1.2.1 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.
- 1.2.2 Trail access/crossings** - Provide safe and adequate trail access, while minimizing trail crossings by motor vehicles. Provide grade separated crossings, such as bridges, overpasses, underpasses, or traffic control devices for high volume/speed motor vehicle crossings.
- 1.2.3 Accessible trails** - Trails and facilities shall be developed in accordance with the guidelines set forth by the Americans With Disabilities Act (ADA) published by the Department of Community Affairs. Refer to Universal Access to Outdoor Recreation: A Design Guideline, published by PLAE, Inc. from MIG Communi-

cations 1802 5th Street, Berkely, California 94710, for additional resources. Modifications can be made to existing trails without reducing the quality of the experience.

- 1.2.4 Routing** - Select routes where minimum barriers and road crossings occur while considering natural resources and natural topography.
- 1.2.5 Trailheads** - Create trailheads that have safe and clear access points and are adjacent to the trail with well marked trail maps, restrooms and other amenities. Appropriate parking facilities should be provided where possible and/or feasible. Trailheads should be classified as primary, secondary or remote.
- 1.2.6 Rest stops** - Rest stops should be appropriately placed based on the type of trail. Include amenities where possible.
- 1.2.7 Signage** - Provide educational and or interpretive directional, informational, regulatory, warning, site sensitive festival signage.
- 1.2.8 Bridges** - Provide bridges, walkways and other crossing facilities where necessary with appropriate safety measures or provide for safe passage.
- 1.2.9 Guardrails** - Use guardrails on dangerously steep terrain, near water hazards and where trails are adjacent to motor vehicle roadways.
- 1.2.10 Visibility** - Provide for clear visibility corresponding to travel speed of trail users, especially at trail intersections, corners and curves.
- 1.2.11 Topography** - Follow the existing topography. Lay out trails to minimize cut and fill of natural topography, while maintaining an appropriate grade for each trail use.
- 1.2.12 Drainage** - 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 drainage. Use indigenous vegetation to prevent erosion wherever appropriate and feasible.
- 1.2.13 Vertical/horizontal clearance** - Clear overhanging limbs and vegetation, to maintain safe trail height and width guidelines, accord-

ing to the intended use of the trail.

- 1.2.14 Obstructions** - Eliminate or modify large obstructions that prevent or hinder passage or provide alternative passage if possible, feasible or appropriate. Where this is not possible, clearly notify of the obstruction sufficiently in advance of the obstruction.
- 1.2.15 Organic Materials** - Use organic and indigenous materials when possible and practical for the construction of trails.
- 1.2.16 Trash 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.
- 1.2.17 Inspections/Evaluations** - Trail managers should conduct preventative maintenance inspections of trails at a minimum of once per year and schedule repairs as necessary.
- 1.2.18 Maintenance** - Trails should have regularly scheduled tread maintenance, pruning, removal of exotic plants, hazards and unsightly debris and trash. Encourage volunteers to assist in trail maintenance.
- 1.2.19 Flood-Prone Areas** - Route trails around, provide alternative trails or temporarily close trails during periods of flooding. Boardwalks, bridges, culverts, existing roads and abandoned rail beds should be utilized for traversing the flood prone area during periods of flooding.
- 1.2.20 Wetlands/Environmentally Sensitive Areas** - Route land based trails around wetlands wherever possible. Utilize boardwalks, bridges, and culverts to cross wetlands wherever feasible, in accordance with applicable regulations.
- 1.2.21 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.
- 1.2.22 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.
- 1.2.23 Aesthetics** - 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.

2. Design guidelines

2.1 Location and routing

- 2.1.1 Topography and Drainage** - 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.
- 2.1.2 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.
- 2.1.3 Environmental Impact** - Trails should be developed with an awareness of regulations and environmentally sensitive resources and areas. Planning and construction techniques should be of minimal impact and should strive to protect all lands, wildlife, vegetation and water related features. Trails should not adversely impact sensitive environmental areas, ecosystems, major wildlife migration patterns, or endangered plant and animal communities. 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 travelways, 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.
- 2.1.4 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).

2.1.5 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.

2.1.6 Accessible Trails - Trails and facilities shall be developed in accordance with the guidelines set forth by the ADA published by the Department of Community Affairs. Refer to Universal Access to Outdoor Recreation: A Design Guideline, published by PLAE, Inc. for IG Communications 1802 5th St., Berkeley, California 94710 for additional resources. Modifications can be made to existing trails without reducing the quality of the experience.

2.1.7 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.

2.1.8 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.

2.1.9 Road/Railroad Crossings and Sight Lines - Design and route trails to minimize contact and conflict with motorized vehicles and provide the appropriate sight lines for safety at the trail crossing. Refer to the Florida Department of Transportation (FDOT) Bicycle Facilities Planning and Design Manual for the appropriate manner to cross motorized corridors.

2.1.10 Social and Economic Impact - Consideration should be given to both negative and beneficial impact of trails on other public facilities, activities and transportation.

2.1.11 Archaeological and Historical Resources - Consider the impact to known and unknown archaeological and historical sites. Efforts

should be made to make interpretation of these sites 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.

2.1.12 Air Quality & Noise - Whenever possible, avoid locating trails in close proximity to heavy traffic and/or active industrial areas.

2.1.13 Contaminated Sites - Do not locate trails on known contaminated sites.

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

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

2.2 Self direction

2.2.1 Standardized Trail Marking 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.

2.2.2 Signs/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.

2.2.3 Private Property - Trails often go through or border private property. Trail users should respect posted signs and exercise caution to avoid trespassing. It is the responsibility of the trail user to know they are not trespassing. Information should be provided at kiosks or on trail maps or en route to inform the trail user.

2.3 Aesthetics

2.3.1 Routing - Wherever possible or feasible route trails along the most visually pleasing

corridor, while maintaining considerations for safety and ecological impact.

2.3.2 Sensory Experience - 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. Provide amenities where possible.

2.4 Cost-Efficiency

2.4.1 Materials and Equipment - Use locally obtainable or salvage materials and equipment when possible.

2.4.2 Community Involvement - Encourage corporate sponsors, local user groups, volunteers and donations to help plan, build and maintain trails.

2.4.3 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.

2.4.4 Recycled Materials - Utilize recycled materials wherever appropriate.

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

2.4.6 Routing and Location - Consider routing and location during the trail planning phase. Review alternate routes for cost effectiveness, environmental impact of that development and public safety.

3. Trail design and construction guidelines

3.1 Hiking and jogging trails

Hiking and jogging 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.

3.1.1 Tread Width

- Low volume use 1 to 2 Feet
- Medium volume use 2 to 5 Feet
- High volume use over 5 Feet

3.1.2 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).

3.1.3 Vertical Clearance - 8 feet minimum clearance.

3.1.4 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%

3.1.5 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.

3.1.6 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.

3.1.7 Length of Hike

- Short Hike 3 to 5 miles
- Half-day to One Day Hike 6 to 12 miles
- Overnight Hike over 12 miles

3.1.8 Trail Marking - See Appendix A

3.2 Off-road bicycling trails

Non-motorized bicycling trails are classified into two types: Paved and unpaved. These guidelines address only those bicycle trails that are unpaved. The Florida Department of Transportation (FDOT) has developed guidelines for the construction of bicycle lanes, paved shoulders, wide curb lanes and paved multi-use trails. The guidelines are provided in the Florida Bicycle Facilities Planning and Design Manual. This may be obtained from the FDOT, Pedestrian/Bicycle Program, 605 Suwannee Street, MS 82, Tallahassee, Florida 32399-0450. The American Association of State Highway and Transportation Officials (AASHTO) and the Manual on Uniform Traffic Control Devices (MUTCD) has also established guidelines.

3.2.1 Tread Width - 18 inches minimum

3.2.2 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).

3.2.3 Vertical Clearance - 8 feet minimum (Except to allow for the occasional natural obstruction which enhances the experience, but does not prevent passage)

3.2.4 Grades - 0% to 50% (0% to 5% at approaches to intersections)

3.2.5 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.

3.2.6 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).

3.2.7 Length of Ride

Short ride 1 to 10 miles
 Medium ride 10 to 40 miles
 Long ride over 40 miles

3.2.8 Trail Marking - See Appendix A

3.2.9 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.

3.2.10 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.

3.3 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”.

3.3.1 Tread Width - 18 inches minimum

3.3.2 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).

3.3.3 Vertical Clearance - 10 feet minimum clearance overhead.

3.3.4 Grades

Desirable grade 0% to 10%
 Maximum grade for extended slope 18%
 Maximum grade for shorter slope 25%

3.3.5 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.

3.3.6 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).

3.3.7 Length of Ride

Short to half-day 5 to 16 miles
 Full day 17 to 32 miles
 Overnight trip Over 32 miles
 (Access to water should be provided every 5 to 10 miles along trail)

3.3.8 Trail Marking - See Appendix A.

3.4 Paddling Trails

Paddling trails are publicly owned waterways that possess scenic and recreational qualities and are accessible by the public. 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 U.S. Coast Guard and Florida Marine Patrol (FMP) regulations. Contact the FMP Office of Waterways Management for an in-water informational signage installation permit.

3.4.1 Water Depth - Except for periods of extreme drought, paddling trails should be a minimum depth of 6 inches.

3.4.2 Portage - Use hiking trail guidelines for land based portage trails.

3.4.3 Trip Length

Short to half day 2 - 08 miles
 Full day 8 - 15 miles
 Overnight Over 15 miles

3.4.4 Trail Marking - See Appendix A.

3.5 Unpaved Multi-Use Trails

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

3.5.1 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.

3.5.2 Unpaved Multi-use Trail - Unpaved multi-use trail for high volume usage is not recommended.

Unpaved multi-use tread for low and medium volume should be as follows:

3.5.2.1 Tread Width - Optimum 5 feet minimum.

3.5.3 Horizontal Clearance - 1 foot minimum on each side of tread.

3.5.4 Vertical Clearance - 10 feet minimum.

3.5.5 Grades

Desirable grade 0% to 5%
 Maximum grade for extended slopes 10%
 Maximum grade for shorter slope 15%

3.5.6 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.

3.5.7 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).

3.5.8 Trip Length - Will vary according to user type.

3.5.9 Trail Marking - See Appendix A of this appendix.

4. 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.

4.1 Trailheads

Trailheads are points of beginning or starting on a trail system. A trailhead will be designated as a location for information about the trail. Provisions should include parking and staging areas.

Trailheads are classified as follows:

4.1.1 Primary - A primary trailhead consists of designated parking and staging area, public telephone, public restrooms, refuse containers, information and interpretive signs, maps or brochures, potable water, picnic facilities, covered shelters, electric service, other appropri-

ate amenities, and direct access by management personnel.

4.1.2 Secondary - A secondary trailhead includes a designated parking and staging area, possibly restrooms, refuse containers, information signs, maps or brochures, potable water, covered shelter, and access by management personnel.

4.1.3 Remote - A remote trailhead includes parking and staging area, information signs, maps or brochures, and access by management personnel.

4.2 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.

4.3 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.

4.3.1 General Parking - Follow FDOT guidelines.

4.3.2 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.

4.3.3 Canoe Trailer Parking - Canoe trailer parking design should be similar in size to the equestrian trailer parking. Canoe parking spaces should be pull-through. A staging area should be designed with close proximity to the water edge to control access.

4.3.4 Bicycle Racks - Racks should be provided at all primary trailheads. They should meet all FDOT design guidelines. Staging areas are the most suitable location for bicycle racks.

4.4 Camping

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

4.4.1 Primitive Camping - zones shall contain minimal amenities and be in remote areas. Primitive campgrounds should be accessible only by foot, horseback, 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.
- Paddling 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.

4.4.2 Location - Camping zones should be designated a short distance off the main trail and well marked.

4.4.3 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.

4.4.4 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.

4.5 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. Campsites located within various public agency lands shall comply with those agency regulations. Provide vertical, open space for tents and horse areas.

4.5.1 Location - Camping zones should be designated off the main trail at a short distance.

Access by management and emergency vehicles shall be designed.

4.5.2 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.

4.5.3 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.

5. Trail crossings

5.1 At-Grade Crossings

Whenever it is necessary to cross roadways and railroad tracks with a trail, special care must be taken to ensure the safety of trail users. 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 road crossings is required. Adequate stopping sight distance must be provided for motorists and trail users.

Equestrian trail crossings at paved roads and railroad tracks, should have enough cleared space on both sides of the road or track to allow 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.

5.2 Above-Grade Road Crossings

Refer to Florida Department of Transportation guidelines.

5.3 Above-Grade Trail Crossings

Bridges and boardwalks should be used where necessary. Trails approaching any crossing should not be reduced in width. 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. Bridges should be constructed above the seasonal high water mark.

5.4 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.

5.5 Fence, Gate and Barricade Crossings

Trails often run through 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. (See Appendix C).

6. Accessible facilities

Modifications can be made to existing trails without reducing the quality of the experience. Refer to the Americans With Disabilities Act (ADA) and/or Universal Access to Outdoor Recreation: A Design Guidelines, on how to achieve increased outdoor access. Parking lots, buildings and walkways at trailheads must be constructed in compliance with ADA guidelines.

Appendix A - Trail signs and markings

Trail Marking - 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/builders should avoid oversigning, which can clutter the environment and result in information overload. Signs must be clear, concise and legible. Their location and placement is critical.

- I. **Trail Signs** are divided into six categories: Directional, Informational, Regulatory, Warning, Educational and Festival.
- A. **Directional Signs** are used to inform trail users of their bearing and route of travel. Signs are recommended to contain some form of graphic symbol and/or a brief description.
 1. Clearly distinguish all primary trail routes from side, access, loop, connector or cross trails.
 2. Use double blazes or some form of graphic symbol for changes in trail direction.
 - B. **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.
 1. Material, color, and size of sign used should be consistent within a given trail.
 2. Use international symbols for all graphics.
 3. 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.
 - C. **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.
 1. Signage must comply with the agency having jurisdiction over land trail crosses.
 2. All regulatory signs should be of black lettering on a white reflective background, unless otherwise directed by the agency having jurisdiction.
 3. Check with local authorities for specific regulations.
 - D. **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.
 1. Warning signs should be of uniform size and placed at a minimum of 50 feet before the hazard and located at the hazard.
 2. Warning sign should be of black lettering on a reflective yellow background.
 3. Sign should be consistent along the same trail.
 - E. **Educational/Interpretive Signs** describe unique natural or cultural features along the trail. Material, color and size should be consistent along the same trail.
 - F. **Festival Signs** are used to promote and advertise special activities and event and are designed at the discretion of the trail manager.
- II. **Trail Marking and Signing**
- A. **Trail Blazes and Signs**
 1. Blazes should be painted vertically at a minimum of 2 inches wide and 6 inches long.
 2. 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.
 3. Blazes or signs should be frequent enough along the trail and indicate the appropriate user type on the correct trail.
 - a. The distance between blazes will vary with terrain or water body.
 - b. The trail must be blazed or signed so it can be followed in either direction.
 - B. **Camping Blazes or Signs**
 1. Designate camping areas with 6 inch wide bands painted around trees, poles or posts surrounding the camping area.
 2. Designated camping areas may be signed on trees, poles or posts surrounding the camping area.
 - C. **Graphic Symbols** - Utilize international symbols wherever possible.
 - D. **Attachment methods**
 1. Paint - Paint directly to tree surface.
 2. Nailed - Use aluminum nails only for use on trees.
 3. Post-mounted
 - a. Land Based - Lumber buried directly into ground a minimum of 2 feet deep, preferably with a cross member at bottom for stability.
 - b. Water Based - Refer to section III. Trail User Signage and the attached "Specifications for Marking Canoe/Kayak Trails" as approved by the Florida Marine Patrol.

III. Trail User Signage

A. Hiking

1. Marking should be 4 to 6 feet high on poles or posts along the trail.
2. Marking should be 5 to 6 feet high on trees along the trail.

B. Bicycling

1. Marking should be 4 to 6 feet high on poles or posts along the trail.
2. Marking should be 5 to 6 feet high on trees along the trail.

C. Equestrian

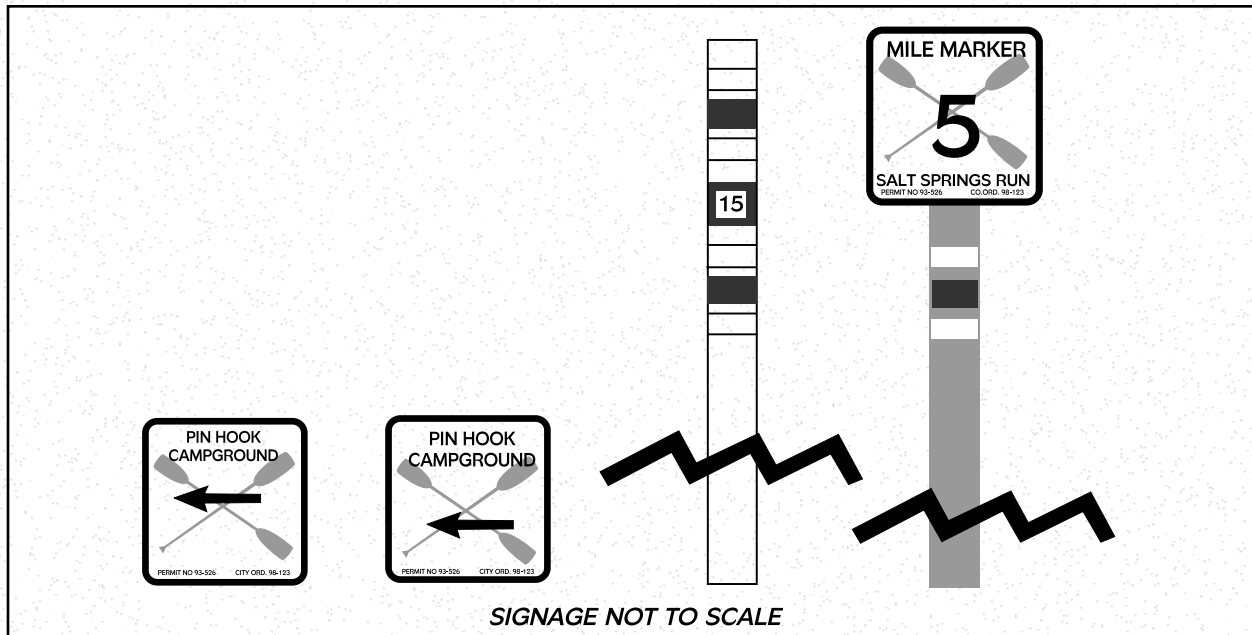
1. Marking should be 4 to 6 feet high on poles or posts along the trail.
2. Marking should be 7 to 8 feet high on trees along the trail.

D. Paddling

1. 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.
2. In-Water informational signage - Review by the U.S. Coast Guard and the U.S. Army Corps of Engineers has been completed. The following conditions have been approved for use as described below.
 - a. Signs placed in Florida waterways require a permit and shall comply with U.S. Coast Guard and Florida Marine Patrol regulations. Contact the FMP Office of Waterways Management for installation permit.
 - b. 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.
 - c. 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.
 - d. Markers/signs shall be a minimum of 12 inches by 12 inches and a maximum of 18 inches by 18 inches.
 - e. 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.)
 - f. Markers/signs to be mounted on min. schedule 40 PVC pipe, 4 inches in diameter.
 - g. 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.
 - h. See next page for illustration.

E. Multi-Use - Use biking/hiking marking heights.

Specifications for Marking Canoe/Kayak Trails



Appendix B

- I **Fence Crossings, Gates and Barricades** should be kept to a minimum to traverse trails. When safety, security, legal requirements, etc., require fence, gate or barricade crossings, to access the trail, the following guidelines are suggested:
- A **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).
- B **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.

Appendix C

TERMS USED IN THE TRAIL GUIDELINES DOCUMENT

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

Appendix D

Trail Construction Bibliography

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