SCLT

Connecting People with Nature since 2006

Trail Standards And Maintenance Manual

1st Edition

Sheridan Community Land Trust

INTRODUCTION

Building and maintaining natural surface, non-motorized trails in Sheridan County is one of the core missions of the Sheridan Community Land Trust (SCLT). This document specifies the fundamental principles and guidelines that we have adopted and that govern us as we plan, build, and ultimately steward that which we create. It serves as a point of reference for best practices throughout the process.

Many key resources were consulted in its formation. Information that reflects the latest thinking from federal and regional agencies, as well as top industry alliances such as the American Trails, the International Mountain Bike Association, the River Management Society have been referenced and compiled.

Though trail standards provide the consistency necessary in the industry, it's important to note that each situation and each location is unique. This document is meant to be as thorough as possible, it is difficult to cover every situation and flexibility in execution is often necessary. Therefore, information presented within is the basis by which we work, by which we evaluate site specific conditions, and by which we implement our objectives. Evolution within the industry, changing regional needs, and ongoing resource protection necessitates this document be amendable. It remains a work in progress that shifts with the changes that direct us to achieve safe, cohesive and sustainable systems.

TRAIL OBJECTIVES

The following trail objectives are our building blocks. They document our intensions, vision and desired outcome when creating non-motorized recreation opportunities.

1. **OBJECTIVE 1 – TRAIL QUALITY.** Provide high quality trails that energize visitors, supports physical wellbeing and creates life-long advocates of natural surroundings.
2. **OBJECTIVE 2 – CONNECTIVITY.** Advance connectivity between existing parks and recreation areas to increase purpose, exposure and socioeconomic impact.
3. **OBJECTIVE 3 – ACCESS.** Expand access to nearby lands and rivers for the use and enjoyment for generations to come.
4. **OBJECTIVE 4 – VISITOR EXPERIENCE.** Provide diversity that enriches enjoyment to attract a wide variety of ages and abilities.
5. **OBJECTIVE 5 – RESOURCE PROTECTION & SUSTAINABILITY.** Ensure compliance with policies, regulations, and guidelines which support, promote and protect the trails and our natural and cultural resources.
6. **OBJECTIVE 6 – COLLABORATION.** Consolidate a broad range of committed community partners vested in increasing recreational opportunities. Continue to grow local support and funding for long-term sustainability.
7. **OBJECTIVE 7 – COMMUNITY ENGAGEMENT.** Engage the public through stewardship and educational opportunities, fostering relationships, understanding and community well-being.

TRAIL DESIGNATIONS

There are many different ways to classify trails. Classifications can describe a type of trail, the trails use, the difficulty levels, the intended management objectives, etc. Classifications not only provide clear and consistent means to record and communicate, they also provide information that directs design, construction, maintenance and use. For the purposes of this document, SCLT defines the different types of trail under its direction, Trail Classes as generally defined by the US Forest Service, and Trial Difficulty Levels from the well-known and widely used International Trail Marking System adapted for trail use by the International Mountain Bike Association (IMBA).

TRAIL TYPE

SCLT manages two types of trails - Terrestrial Trails and Water Trails. These reflect the general mode of travel and the type of surface. Each has been designed and is managed according to their particular use.

- Terrestrial Trails are predominately constructed on ground and are designed and managed to accommodate use on that surface.

- Water Trails have a surface consisting predominantly of water but may include land-based portages and access points.

Many of the guidelines and fundamentals presented here relate to both types of trails. Those that are particular to **Water trails** can be found at the end of this document in a section dedicated specifically to management of Water Trails.

Equestrian trails are also constructed with largely the same design principles, and are similarly maintained as discussed in the following. A brief introduction to SCLT's philosophy regarding equestrian trails is given at the end of the document, however Details related to the various types or classes of Equestrian trails, as well as specific design parameters related to each, are not outlined but can be found by accessing the sources listed in the Reference.

TRAIL CLASS

The US Forest Service Trail Class Matrix is in wide use throughout the industry in one form or another, since it effectively groups trails by intended design, development, and management requirements. With many of SCLT's trails located on public lands, the following scale has been adapted for our use as well (*Figure 1*). To date, SCLT's trails fall into Class III-IV.

CLASS I
- Minimally Developed. Remote, historic, primitive trails. Maintained as low-impact or lightly used wilderness like trail.

CLASS II
- Moderately Developed. Planned and maintained as native surface single-track trail, sometimes on rough terrain.

CLASS III
- Developed. Planned and maintained primarily as native surface single-track trail.

CLASS IV

- Highly Developed. Planned and maintained as native or improved surface double-track or single-track trail.

CLASS V

- Fully Developed. Planned and maintained as improved surface double-track or road like trail.

Figure 1

Adopted for use from Trail Fundamentals and Trail Management Objectives (September 2016)

Trail Class Matrix (FSH 2353, Section 14.2, Exhibit 01)

Trail Classes are general categories reflecting trail development scale, arranged along a continuum. The Trail Class identified for a National Forest System (NFS) trail prescribes its development scale, representing its intended design and management standards.[1] Local deviations from any Trail Class descriptor may be established based on trail-specific conditions, topography, or other factors, provided that the deviations do not undermine the general intent of the applicable Trail Class.

Trail Attributes	Trail Class 1 Minimally Developed	Trail Class 2 Moderately Developed	Trail Class 3 Developed	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Tread & Traffic Flow	• Tread intermittent and often indistinct • May require route finding • Single lane with no allowances constructed for passing • Predominantly native materials	• Tread continuous and discernible, but narrow and rough • Single lane with minor allowances constructed for passing • Typically native materials	• Tread continuous and obvious • Single lane, with allowances constructed for passing where required by traffic volumes in areas with no reasonable passing opportunities available • Native or imported materials	• Tread wide and relatively smooth with few irregularities • Single lane, with allowances constructed for passing where required by traffic volumes in areas with no reasonable passing opportunities available • Double lane where traffic volumes are high and passing is frequent • Native or imported materials • May be hardened	• Tread wide, firm, stable, and generally uniform • Single lane, with frequent turnouts where traffic volumes are low to moderate • Double lane where traffic volumes are moderate to high • Commonly hardened with asphalt or other imported material
Obstacles	• Obstacles common, naturally occurring, often substantial and intended to provide increased challenge • Narrow passages; brush, steep grades, rocks and logs present	• Obstacles may be common, substantial, and intended to provide increased challenge • Blockages cleared to define route and protect resources • Vegetation may encroach into trailway	• Obstacles may be common, but not substantial or intended to provide challenge • Vegetation cleared outside of trailway	• Obstacles infrequent and insubstantial • Vegetation cleared outside of trailway	• Obstacles not present • Grades typically < 8%
		• Bridges as needed for resource protection and appropriate access	appropriate access	• Trailside amenities may be present	
Signs[2]	• Route identification signing limited to junctions • Route markers present when trail location is not evident • Regulatory and resource protection signing infrequent • Destination signing, unless required, generally not present • Information and interpretive signing generally not present	• Route identification signing limited to junctions • Route markers present when trail location is not evident • Regulatory and resource protection signing infrequent • Destination signing typically infrequent outside of wilderness; generally not present in wilderness • Information and interpretive signing not common	• Route identification signing at junctions and as needed for user reassurance • Route markers as needed for user reassurance • Regulatory and resource protection signing may be common • Destination signing likely outside of wilderness; generally not present in wilderness • Information and interpretive signs may be present outside of wilderness	• Route identification signing at junctions and as needed for user reassurance • Route markers as needed for user reassurance • Regulatory and resource protection signing common • Destination signing common outside of wilderness; generally not present in wilderness • Information and interpretive signs may be common outside of wilderness • Accessibility information likely displayed at trailhead	• Route identification signing at junctions and for user reassurance • Route markers as needed for user reassurance • Regulatory and resource protection signing common • Destination signing common • Information and interpretive signs common • Accessibility information likely displayed at trailhead
Typical Recreation Environs & Experience[3]	• Natural, unmodified • ROS: Typically Primitive to Roaded Natural • WROS: Typically Primitive to Semi-Primitive	• Natural, essentially unmodified • ROS: Typically Primitive to Roaded Natural • WROS: Typically Primitive to Semi-Primitive	• Natural, primarily unmodified • ROS: Typically Primitive to Roaded Natural • WROS: Typically Semi-Primitive to Transition	• May be modified • ROS: Typically Semi-Primitive to Rural • WROS: Typically Portal or Transition	• May be highly modified • Commonly associated with visitor centers or high-use recreation sites • ROS: Typically Roaded Natural to Urban • Generally not present in wilderness

[1] For National Quality Standards for Trails, Potential Appropriateness of Trail Classes for Managed Uses, Design Parameters, and other related guidance, refer to FSM 2353, FSH 2309.18, and other applicable agency references.

[2] For standards and guidelines for the use of signs and posters along trails, refer to the Sign and Poster Guidelines for the Forest Service (EM-7100-15).

[3] The Trail Class Matrix shows the combinations of Trail Class and Recreation Opportunity Spectrum (ROS) or Wilderness Recreation Opportunity Spectrum (WROS) settings that commonly occur, although trails in all Trail Classes may and do occur in all settings. For guidance on the application of the ROS and WROS, refer to FSM 2310 and 2353 and FSH 2309.18.

TRAIL DIFFICULTY LEVELS

The purpose of difficulty levels is to provide essential information to assists users in making informed decisions to match trails to skill level. In turn this helps manage risk, minimize injury, and improve the overall trail experience. Difficulty levels also aid managers in the planning and designing of systems.

Trail difficulty levels rate technical challenge, not physical exertion. Four criteria are used to determine ratings: Tread Width, Tread Surface, Trail Grade, Obstacles and Technical Features. Trails can have two types of features, Native or Natural Trail Features (NTFs) and Technical Trail Features (TTFs). Native Trail Features (NTFs) are native earth, logs, roots, and rock features that add challenge to the trail (sometimes added to the tread, sometimes naturally occurring). Technical Trail Features (TTFs) include use of non-native materials, generally fastened wood or metal construction.

Each trail and each feature along the trail is reviewed and measured to determine its difficulty. The trail will be rated by the hardest difficulty where no alternate section is present. All alternate features rated at a higher difficulty than the trail's rating shall be individually signed. Detailed specifications are found in *Figure 2*. Descriptions relative to SCLT trails are as follows:

NAME: Easy. SYMBOL: Green circle O

GENERAL

- Minimum skill required.
- Gentle climbs and easily avoidable obstacles such as rocks, roots and potholes.
- NTF/TTF shall be alternate to the main tread (except on designated Technical Trails).

EXPECTED TRAIL FEATURES

- Wide, flat, low, rollable features
- No drops or jumps

NAME: More Difficult/Moderate. SYMBOL: Blue Square [ ]

GENERAL

- Intermediate skills required.
- Challenging with moderate slopes or obstacles, possibly narrower with mixed traction.
- NTF/TTF shall be alternate to the main tread (except on designated Technical Trails).

EXPECTED TRAIL FEATURES

- Small features wide and rollable
- Small rollable drops
- Small jumps

NAME: Difficult. SYMBOL: Black Diamond <>

GENERAL

- Advanced skills required.
- Could include a mixture of steep climbs and descents, loose trail surfaces, numerous difficult obstacles to avoid or jump over, drop-offs and sharp corners. Some sections may be easier to walk.
- NTF/TTF shall be alternate to the main tread (except on designated Technical Trails)

EXPECTED TRAIL FEATURES

- Elevated features
- Connected features may require wheel lifting techniques
- Drop offs not exceeding 5' vertical, Large double jumps
- Steep descents with sharp transitions

NAME: Extremely Difficult. SYMBOL: Double Black Diamond <><>

GENERAL

- Exceptional rider skills and balance are essential to clear challenging obstacles or jumps.

EXPECTED TRAIL FEATURES GENERAL

- Elevated features
- Connected features
- Mandatory air - gap jumps
- Steep descents with sharp transitions
- Risk exceeds Difficult due to height, widths and exposure

Figure 2

International Trail Marking System adopted by the International Mountain Bike Association (IMBA)

Trail Difficulty Rating System

	Easiest White Circle	Easy Green Circle	More Difficult Blue Square	Very Difficult Black Diamond	Extremely Difficult Dbl. Black Diamond
Trail Width	72" or more	36" or more	24" or more	12" or more	6" or more
Tread Surface	Hardened or surfaced	Firm and stable	Mostly stable with some variability	Widely variable	Widely variable and unpredictable
Average Trail Grade	Less than 5%	5% or less	10% or less	15% or less	20% or more
Maximum Trail Grade	Max 10%	Max 15%	Max 15% or greater	Max 15% or greater	Max 15% or greater
Natural Obstacles and Technical Trail Features (TTF)	None	Unavoidable obstacles 2" tall or less Avoidable obstacles may be present Unavoidable bridges 36" or wider	Unavoidable obstacles 8" tall or less Avoidable obstacles may be present Unavoidable bridges 24" or wider TTF's 2' high or less, width of deck is greater than 1/2 the height	Unavoidable obstacles 15" tall or less Avoidable obstacles may be present May include loose rocks Unavoidable bridges 24" or wider TTF's 4' high or less, width of deck is less than 1/2 the height Short sections may exceed criteria	Unavoidable obstacles 15" tall or greater Avoidable obstacles may be present May include loose rocks Unavoidable bridges 24" or narrower TTF's 4' high or greater, width of deck is unpredictable Many sections may exceed criteria

SUPPORTING GUIDELINES AND STANDARDS

This section contains guidelines and standards about planning, placement and construction of trails. In certain cases, deviation from these recommended standards should be allowed where safety or user experience is not compromised, and the rationale for the deviation is defensible. For example, narrowing the core trail to less than the recommended width in sensitive environmental areas or widening it for safety reasons. For more specific guidance or for items not addressed in the following consult the references below and/or the current information available on the internet.

PLANNING PROCESS

When planning recreation opportunities, the following generally summarizes the steps taken by SCLT personnel. These steps may differ in detail and execution depending on the requirements of the particular land agent involved (USFS, BLM, State, Local Government, or Private Landowner, etc.).

1. **INTERNAL ANALYSIS AND REVIEW.** Background data is collected and reviewed internally with personnel, board members and SCLT's Recreation Work/Advisory Group. An initial field inventory may occur prior to or following an internal review.
2. **SCOPING.** Discussions are initiated with all necessary persons, organizations, and/or agencies needing to be involved in the planning process. Comments and suggestions are gathered from participants. If it hasn't been done already, resource and user data is gathered such as ecological, educational, scenic, cultural, geologic, and geographic resources, social and economic factors, and use characteristics. Data may be gathered through sources such as field inventory, study of file documents, interviews with resource specialists, and/or scientific research documents.
3. **PUBLIC INVOLVEMENT.** Meetings, announcements, and/or other means of sharing details regarding the project and for gathering comments shall be undertaken when applicable. This may be a multi-step process over a long time frame.
4. **ANALYSIS.** Public comments and/or resource data is compiled. The information is analyzed and decisions made that will direct the drafting of a plan.
5. **DRAFT PLAN.** A plan is drafted and sent to stakeholders that includes purpose and need, proposed trails and trailheads, project details, proposed action, funding/sustainability, maps, and any other designated proponents.
6. **REVIEW AND RESUBMITTAL.** Comments and suggested proposed measures are reviewed and analyzed for inclusion into the final draft. Plan is rewritten and resubmitted to stakeholders for approval.

FUNDAMENTALS OF TRAIL DESIGN AND CONSTRUCTION

All intrusions into the environment have some degree of impact therefore the benefits of a trail for recreational purposes must be balanced with measures to protect the environment. When trails adversely impact the environment they generally deteriorate in time, have a low aesthetic value and incur a high maintenance cost. When trails are designed and built correctly for the specific environment and an intended trail use, environmental impacts can be minimized.

In addition to following design guidelines, implementation of a plan should reflect several basic design philosophies when trail construction is considered:

1. POTENTIAL USER RANGE OF ABILITIES, and carrying capacity when designing a trail segment. Trail width, slope, surface and accessibility determine the type of trail user and helps define the level of safety and overall quality of experience.

2. DESIGN TO AVOID OR MITIGATE ENVIRONMENTAL IMPACTS by not encroaching upon wetlands or riparian corridors, critical habitat areas, and erosive landforms. Follow natural contours to minimize cut and fill activities. Meander around fragile or established features. Make every effort to preserve existing vegetation. If environmental impacts are unavoidable, mitigate with proven successful methods. When applicable to the overall design goal utilize areas of existing disturbance such as utility line easements, abandoned rail corridors or ditches.

3. MINIMIZE OR MITIGATE IMPACTS OF TRAIL UPON ADJACENT LANDOWNERS. Some trail sections may be in close proximity to residential, commercial, industrial or agricultural development. These conflicts must be identified as part of the analysis for each trail segment. Mitigation measures shall be identified and may include but are not limited to realignment, fencing, berming, and screening. This aspect of the trails segment analysis and design is very important to the community success of the system. The "good neighbor" policy is particularly important during the construction period.

4. DESIGN FOR EASE OF MAINTENANCE. If possible, avoid constructing trail sections through areas of poor drainage, unstable soils, rock or snow slide areas, through shaded icy spots, or in areas of mature vegetation that is prone to deadfall, debris or surface roots. Consider vandalism susceptibility and prevention when selecting materials and accessories.

5. DESIGN FOR EASE OF USE. Keep construction (uniform surface type and width) and accessories (signs, trailheads) consistent throughout the system to promote an image of reliability/ease of use.

6. MAXIMIZE POSITIVE CONTROL POINTS (SCENIC VIEWS, ATTRACTIONS, ETC.). Route to include features that will naturally attract users while on the trail.

7. CONSIDER SAFETY OVERALL. Safety is the primary focus of the following recommended design standards.

SPECIFIC GUIDELINES

The purpose of this section is to provide a general overview of the primary guidelines adopted and in use by SCLT; it is not to recreate every trail construction specification used in the industry in detail. For more specific guidance or for items not addressed in the following consult the references below and/or the current information available on the internet.

DESIGN

GENERAL DETAILS

- Trail placement should avoid hazard areas such as unstable slopes, soil prone to erosion, undercut stream banks, cliffs, and embankments, etc.
- Avoid routes that impact wildlife species, critical habitat of rare or fragile plant species and sensitive or fragile archaeological or historic sites.
- Avoid trail routing that encourages users to take shortcuts where an easier route or interesting feature is visible. If an interesting feature exists, locate the trail to provide the desired access. Use landforms or vegetation to block potential shortcut routes.
- Avoid routing a trail too close to another trail section to prevent trail proliferation or shortcuts between the two trails.

- Use rock armoring in sensitive areas and steep descents to minimize trail erosion.

AQUATIC ENVIRONMENTS

- Posts in direct contact with water should be inert (for example, natural untreated wood, pre-cast concrete or steel) to avoid water quality impacts associated with chemical leaching from treated wood.
- Stringer bridges are the preferred method for crossing streams. Pile supported structures are preferred over slabs or floats for bridges requiring supports in contact with streams.
- Locate bridge crossings to minimize disturbance to streambeds and banks. Preferred crossings are at sections of the waterway that are straight and where banks are stable.
- Construct bridges across streams to top-of-the-bank. This minimizes erosion of stream banks and sedimentation of streams.

SOILS

- Avoid turns/obstacle that cause abrupt braking and keep sight lines open to prevent skidding.
- Trails should be built and maintained to withstand expected erosive forces.
- Trail design should encourage users to stay on the trail to avoid damage to adjacent areas.

CONSTRUCTION

SAFETY

SCLT takes personal well-being and safety seriously and assesses worker capability, limitations and skills. Only highly skilled contractors are considered when bidding a project. Training for safe and proper use of tools and equipment is presented to volunteers and SCLT personnel when applicable. Proper personal gear, clothing and protection is recommended at all times. First aid kits are available during all trail related activities.

USE OF MACHINERY

Limited access trails that penetrate sensitive areas should be constructed manually with materials and equipment that can be easily transported by small work crews. If machinery is used, low impact construction techniques shall be employed. Care shall be taken to preserve the material below and beyond the established lines of excavation, preventing unnecessary destruction, scarring, or defacing of the natural surroundings.

CREATING THE TRAIL CORRIDOR

- The corridor is a zone that includes the trail tread and the area above and to each side.
- Dimensions are determined by target users and desired trail difficulty levels (see Trail Class & Trail Difficult Levels above).
- Trails below shall be closed if the possibility exists that clearing could put visitors at risk.
- Tree should only be removed when deemed unable to avoid. Safe methods will be employed.
- Rock removal should be done using appropriate tools and safe lifting techniques. Removed rocks will be placed securely so as to avoid unintentional rock fall.
- Strategies such as leaving/adding material can be used to help hold traffic to the center. However, such material must not trap/run water, or present safety issues.
- Visual impact is important therefore vegetation removal that leave straight and severe edges is discouraged. A feathered, meandered approach is encouraged.
- Vegetation shall be cut flush to the ground or slightly above the branch collar, and done in a manner to avoid tearing of the bark and damaging the plant.
- Stumps or protruding limbs that could cause injury in the fall zone must be removed.
- Debris shall be scattered out of sight of the trail if possible, with cut ends facing away.

- In cases of excessive debris, brush piles that attract birds and wildlife can be constructed.
- Standing dead vegetation may remain unless determined hazardous or obstructive.

ESTABLISHING A NATURAL SURFACE TRAIL FOUNDATION

- Level ground- the surface should not be unnecessarily disturbed to obtain a trail base. Base may be formed by building up rather than cutting down.
- Hillslopes- the amount of excavation needed depends on the slope. Full bench cuts are recommended. If fill is used it should be retained.
- Backslope is the excavated, exposed area above the trail surface and cannot be steeper than the exposed material's ability to stay put during typical climatic conditions. Backslopes shall be smooth, not impede the flow of water and match the slope of the existing ground if possible.
- Fill material should be suitable (no organics or duff) and similar to the original tread. If retrieved nearby, care shall be taken not to adversely affect surrounding areas.
- Turns will be constructed according to accepted industry standards.
- All hardened tread shall be done to industry standards to ensure stability and durability.
- Compaction should be incorporated on both the backslope and tread. A firm and consistent tread surface is crucial whether achieved through hand tamping methods or mechanical means such as plate or roller devices. When left undone, trail users will compact the tread in undesirable ways.

SURFACE WATER CONTROL

- Frequent and natural appearing drainage structures will be constructed in the tread.
- Tread shall be outsloped ~5% to maximize the effects of water flow and prevent erosion.
- To promote self-cleaning drains, grade dips shall be deep and long (>15%, 6' long or greater in bottom).
- All in-slope turns will include grade dips before and after each turn.
-

SPOILS

- All spoils must be distributed as to not block drainage from the tread surface and in such a matter that native vegetation adjacent to the trail is not negatively impacted.
- Spoils shall not be distributed into drainages or adjacent to streams.

FENCE CROSSINGS AND FENCING

Most of the trails within SCLT trail systems are multi-use, creating the need for multiple types of entries when crossing fences. Depending on the access, SCLT will incorporate a swing or drop gate, a pedestrian turnstile and/or a bike roll over guard. Should fencing be required, the installation and materials used will be done per land agency or landowner requirements.

NATIVE TRAIL FEATURES (NTFs)

- NTFs can utilize native dirt, rocks and logs to create challenging features
- No imported materials shall be used excepting rebar for pinning logs to the ground.
- NTFs shall be alternative to the main tread excepting designated Technical Trails
- NTFs may be the main tread on designated jump trails.
- Qualifiers: By placing a narrow section or difficult turn early while the NTF is still close to the ground (known as a qualifier), inexperienced riders may dismount prior to the TTF getting too high above the ground where the rider is more likely to be injured should a fall occur.
- Make the highest difficult section visible from the entry: By placing the difficult section in view, the rider can make an informed decision before they may get into trouble with a TTF that may be beyond their ability. Avoid wide, easy entrances leading to high, narrow exposed features. Features should appear to be as challenging as they actually are.

- Strength of log spans will be based on the capability of each span of the NTF carrying a centered vertical load of 500 lbs. (approximately two times the heaviest rider/bike/gear).
- All rocks shall be placed in manner solidly fixed to the ground and/or adjacent rocks.
- Maximum height and minimum width are dependent on the NTFs difficulty rating.
    - Easy: less than 2', minimum tread width of flat decking is three-quarters the height
    - More Difficult: less than 4', minimum width of flat decking is one-half the height.
    - Most Difficult: less than 6', minimum width of flat decking is one-quarter the height.
    - Expert Unlimited: less than 10', minimum width of flat tread is one-fifth the height.
- All NTFs will be inspected as described below in the Trail Maintenance Standards.

TECHNICAL TRAIL FEATURES (TTFs)

- Qualifiers: By placing a narrow section or difficult turn early while the TTF is still close to the ground (known as a qualifier), inexperienced riders may dismount prior to the TTF getting too high where the rider is more likely to be injured should a fall occur.
- Make the highest difficulty section visible from the entry: By placing the difficult section in view, the rider can make an informed decision before they may get into trouble with a TTF that may be beyond their ability. Avoid wide, easy entrances leading to high, narrow exposed features. Features should appear to be as challenging as they actually are.
- TTFs over 16" in height will be engineered when required by land managers. For the purpose of constructing TTFs less than 16" in height, they shall follow USFS National Trails Drawings and Specifications and shall not require further engineering.
- Basic engineering specifications, if required, will be based on the capability of each TTF span carrying a centered vertical load of 500 lbs. (approx. two times the heaviest rider/bike/gear).
- Every individual rung should be capable of holding 250lbs (approx. one rider/bike/gear).
- TTFs will not be mounted to living trees.
- The finish must be such that if a rider were to fall, the structure or other protrusions would not increase the degree of the injury.
- Maximum height and minimum width are dependent on the TTFs difficulty rating.
    - Easy: less than 2', minimum tread width of flat decking is three-quarters the height.
    - More Difficult: less than 4', minimum width of flat decking is one-half the height.
    - Most Difficult: less than 6', minimum width of flat decking is one-quarter the height.
    - Expert Unlimited: less than 10', minimum width of flat tread is one-fifth the height.
- All TTFs will be inspected as described below in the Trail Maintenance Standards.

BRIDGES, RAILINGS, RUNG SPACING AND SURFACING

As per Forest Service standards, any bridge 30 inches or more in height above ground shall have standard railings. Railings shall be 42 inches in height. A 4" sphere must not pass through the lower 34" and 8" sphere through between 34" and 42". Rungs must be placed tightly so that children will not catch their feet between rungs. An appropriate spacing between rungs is 1" to 1.5" to promote drainage of water. It is recommended that wood surfaces with a slope exceeding 20%, will have a rough cut wood surface. All users, especially users with dogs will be encouraged to use bridges as opposed to walking adjacent to the bridge, potentially compromising a sensitive area the bridge was intended to protect. Carrying capacities, designs, etc. will be found in the reference below or in numerous postings online. All structures will be inspected as described below in the Trail Maintenance Standards.

FALL ZONE GUIDELINES

The fall zone is 5' to each side of the tread of NTF/TTFs. Fall zones should be reviewed for hazards. Hazard mitigation efforts can be limited to those items that can be reasonably

expected to be reshaped or removed using hand tools while maintaining the natural characteristics of the terrain. Methods to reduce risk in fall zones include but are not limited to:

- The fall zone need not be cleared of all foliage; the purpose of fall zone guidelines is to reduce the chance of injury should a fall occur. Replanting of the fall zone with a durable locally occurring species may be considered.
- Cutting or digging out sharp objects.
- Trimming tree branches to the bole.
- Covering of hazards is another option if material such as rotten logs, bark, mulch, dirt, etc. is available, some areas may need periodic re-covering.
- Dulling of sharp points or edges of exposed rocks.

SIGN GUIDELINES

Signs are a necessary component of trail management. They provide the user with information that will allow them to make an informed and educated choice. To preserve the visual quality of the natural environments in which our trails pass, SCLT has adopted a policy of using signs sparingly where possible, and keeping signs neat and in character with their surroundings. SCLT's signs will be comprised of three levels: Trail Network Kiosks, Trail Wayfinding Signs and Trail Advisory Signs. Design and materials may vary from one network to another but are generally consistent within the system.

KIOSKS- Located at a parking lot or similar entrance to a network of trails, information for trail network signs may contain a combination of the following basic information:

- Map of area.
- SCLT information.
- Acceptable trail user groups.
- Trail difficulty levels.
- Rules of the trail including Leave No Trace.
- Trail etiquette.
- Safety and emergency numbers.
- Bulletin board or area for posting events, notices, etc.
- Trail maps for distribution.

WAYFINDING SIGNS- These signs are to be located at the entrance(s) of a particular trail to provide the user with the information necessary to make an informed and educated decision whether to proceed or not.

- Trail name.
- SCLT information.
- Difficulty rating.
- Trail length (distance to next landmark).
- Accepted/restricted users.

ADVISORY SIGNS- A general category of sign used to alert users to: increasing difficulty, locating continuing segments of trails, road crossings, specific restrictions, safety/risk information, etc.

SCLT TRAIL MAINTENANCE STANDARDS

INTRODUCTION

Trail maintenance is an integral part of managing trails. SCLT is dedicated to keeping each trail in its charge easily passable, clearly and consistently marked, and in a condition that protects both the user and the environment through which it passes. If not maintained properly over the long term, the infrastructure of a trail system may be become a wasted investment of financial and natural resources. Since industry guidance and standards for design change, and environmental issues evolve, this document remains amendable and a work in progress.

FUNDAMENTALS OF SCLT'S MAINTENANCE PROGRAM

In general, high use trails and trails with higher difficulty ratings require a greater level of maintenance and an expedited response to trail deterioration. The Core Trail Maintenance Program envisioned by this plan is comprised of four basic approaches:

- Assess and outline expected annual trail maintenance needs for both regular upkeep and circumstantial needs.
- Build the capacity of SCLT's Stewardship Programs to undertake simple, immediate trail maintenance tasks with minimal supervision from SCLT.
- Educate the public on proper trail use and preservation.
- Develop strategies for securing a financial reserve for ongoing and emergency maintenance of the trail and associated structures.

Trail Maintenance Program Goal:

Continually advance our cooperative maintenance program, combing trained seasonal trails technician(s) and volunteers to handle associated maintenance tasks.

Volunteer Program(s):

From the trail systems inception, there has been a core motivation to be stewards of the land. We believe that the most fulfilling way to do this is to share the load among many thru programs where the community collectively contributes to the preservation and maintenance of "their" trail systems. Attachment A introduces and outlines SCLT's current Stewardship Program.

Recommended Maintenance Schedule:

Monitoring trail conditions is on ongoing activity for SCLT, undertaken each time a trail steward or SCLT personnel visits a trail. Physical condition, aesthetic appeal and ways to improve the trail are continually being considered. The following identifies a recommended frequency for activities-

- All trails will be patrolled at least once a month, with more frequent patrolling occurring on those trails heavily used and where litter or debris from adjacent roadways or in parking facilities/trailheads may be a problem.
- Trails with thick vegetation or erosion prone areas will be inspected at least every 2 weeks.
- Trails will be inspected as soon as possible following severe storms events.
- Weed control done as needed with extra attention in spring when weeds are actively growing.
- Vegetation control including mowing/trimming up to 2 feet on each side of the trail will be done as needed.
- Signs, trail furnishings, NTFs and TTFs will be inspected at each visit and addressed as needed.
- Road crossings will be inspected at each visit for safety and risk issues.

- Pet waste containers will be emptied as needed.
- Repair to trail surface, corridor, and structures done as soon as possible with anything posing a safety/risk issue closed immediately until repaired, replacement or deconstruction is complete.

Maintenance Triggers:

- NTF/TTF deterioration.
- Short-cutting of trail segments, turns, features.
- Trail drifting or sliding downhill.
- Vegetation cover loss.
- Trail proliferation (widening or braiding).
- Trail rutting or soil loss.
- Sight line obstruction.
- Poaching or unauthorized trails.

Maintenance Priorities:

1st Priority- Correct unsafe situations.
2nd Priority- Correct issues causing significant trail damage.
3rd Priority- Restore trail to the planned design standard.

Reporting and Logging Information:

The information gathered from inspections and the hours spent to keep the trails functioning as intended is used in making management decisions, for fulfilling obligations to governing bodies and private landowners, and for obtaining support and funding. Attachment B, the Trail Inspection Form and Attachment C, the Work Log, provides a track record.

MAINTENANCE GUIDELINES

Rehabilitation is necessary from time to time to protect the trails and keep them functioning as intended. The principle problems encountered are: soil compaction from overuse, cupping, erosion, sluffing of the back-slope, natural sliding or wearing of the outer edges, and widening/braiding as users choose the path of least resistance. Techniques below are guidelines for generally accepted basic corrective measures.

Tread Rehabilitation

Compaction and Cupping: If a trail gets compacted and cupped from overuse, water will channel and erosion will accelerate. Tread shall be reshaped as follows:

- Dirt shall be pulled from the outer edge and dispersed, or pulled back across the tread and compacted.
- Tread out-slope shall be reestablished so water sheets off tread, not channels/flows downhill.

Collapse of Critical Edge: Breakdown occurs when use concentrates along the outside of the tread, erosion will accelerate as sheeting of water accelerates. Tread shall be reshaped as follows:

- A slight out-sloping (recommended 5%) will be reestablished by lowing the inside of the tread.
- Natural obstacles shall be placed along the outer edges at intervals to direct users back toward the center and discourage excessive wearing of the edge. Care shall be taken not to create a barrier that blocks sheeting.

Slumping of Back-slope: When excess material gathers on the slope side of the tread due to sluffing, users are forced outward, trails widens and/or braiding occurs. Back-slope shall be reshaped as follows:

- Scrape to restore tread to original level and reestablish out-slope when necessary.

Ruts: Deep ruts may require "block and fill" technique that consists of filling the rut with hard material such as rock or gravel, then topping with native soil, and compacting until restored.

Maintaining Tread Classifications: The frequency and size of obstacles and vegetation within the tread generally increase overtime. Rehabilitation shall be as follows:

- To reduce future maintenance needs all vegetation growing directly in the tread (except for low grasses and forbs) shall be dug out. If not possible, cut stems flush to the ground.
- All rocks, roots and other obstacles above that allowed for the trail class will be dug out or cut off and resulting holes filled and compacted.

Drainage

Rolling Grade Dips/Drainages: Designed to exit water from the trail, when these features become clogged, are in insufficient number, constructed or placed incorrectly, the trail easily becomes damaged by the effects of water and wear. Rehabilitation of features shall be as follows:

- If sediment is building up in the bottom, reestablish proper width and depth of dip.
- If erosion is occurring, reestablish rock apron at spill point by clearing built-up debris/sediment.

Hardening/Armoring: Over time, hardened areas can settle, breakdown or become insufficient to handle the task. Improvements and/or enhancement should be contemplated before simply rebuilding or resetting the feature.

Corridor

Maintaining the corridor and safety sight lines consists of clearing, grubbing, trimming, removing and disposing of live and/or dead vegetation. Retaining the maximum amount of vegetation within a particular trail class is fundamental to maintaining a natural trail experience. Rehabilitation shall be done as follows:

- Vegetation shall be cut flush to the ground or slightly above the branch collar, and done in a manner to avoid tearing of the bark and damaging the plant.
- Stubs pose a safety issue, are unsightly, and should not be left.
- Debris shall be scattered out of sight of the trail if possible, with cut ends facing away.
- In cases of excessive debris, brush piles that attract birds and wildlife can be constructed.
- Standing dead vegetation may remain unless determined hazardous or obstructive.

All Structures (NTFs, TTFs, Bridges, Fence Crossings, Accessories, etc.)

- All structures within SCLT's trail systems will be inspected each visit to ensure serviceable condition. Inspections will be recorded on SCLT Trail Inspection Forms, which will be available to land managers and other interested parties for review upon request. TTFs that do not pass inspection will be immediately closed until repaired, replaced or deconstructed.

Trail Deactivation

In the case of valued existing trails, when trail deactivation is unlikely to succeed, trail management becomes the preferred option. When considering, evaluate the continuing cost of maintenance to manage the trail. A trail deactivation/closure may not be successful if the trail has been established, is well used, and no alternative route is proposed. The resulting damage may be worse than had the trail remained open and effectively managed. There may be a number of reasons for obliterating an existing trail. The following should be taken into account;

- Is the trail popular?

- Is the level of impact acceptable or can it be made acceptable by management?
- Can the trail or part of the trail be rerouted to improve the situation?
- Are there suitable alternatives for users if the trail is obliterated?
- Is the trail historically significant?

Alternates to trail obliteration:

- Management of trail use.
- Temporary closures.
- Reroute sections of trail.
- Exclusion of damaging users.
- Education of users with signs or other education initiatives.

When considering obliteration of trails, steps must include the following:

- Consult user groups.
- Public notice.
- Monitoring to ensure trail remains obliterated.
- And may include:
- Signs informing users of reasons for closure.
- Fences.

Deactivation Techniques:

- Restore to as close to the natural condition as possible thru scarification and reshaping the landform, placement of soil, much, rock, deadwood, and/or planting live vegetation or seeding.

SCLT WATER TRAILS

INTRODUCTION

At the time of this writing, SCLT has incorporated an estimated 50 miles of water trail and developed 15 access points on four rivers that traverse Sheridan County: Tongue River, Big Goose, Little Goose and Goose Creek. A great number of partnerships were made in the undertaking. To provide users important information, a page specific to the water trails was developed on SCLT's website and can be found at the following: https://issuu.com/sclt/docs/tongue_river_water_trail_assessment. SCLT's River Trail Assessment documents all that went into getting the project underway; a copy of which can be obtained from the SCLT office.

As with terrestrial trails, the water trails segment of this manual is intended to provide a resource that specifies the fundamental principles and guidelines SCLT uses to plan, develop, and steward our community's water resources. Water trails have become a large part in SCLT's mission since they provide opportunities for communities to establish and strengthen their identity, attract tourists, promote healthy lifestyles, and grow the local and regional economy.

A water trail designation: The most common way to describe a water trail is that it's a recreational paddling route specifically dedicated for people using small craft such as kayaks, canoes, row boats, stand-up paddleboards (SUPs), and other small floatation items such as inner tubes. So then, how does that differ from a place people have paddled for years? The difference is that water trails are organized and supported by a dedicated entity and/or community partnerships whose intention is to be responsible for long-term funding, development and management. Water trails are as popular as terrestrial trails in areas where waterbodies are prevalent and over the years criteria to support designations have been developed-

- Provides a quality trail experience.
- Provides clear information to users.
- Demonstrate broad community support.
- Demonstrate a sustainable business, maintenance and marketing plan.
- Ensure compliance with local land-use plans and environmental laws.
- Supported by landowners in which access points are located.

Much of what is presented below is adapted from a resource guide for water trail planning developed through the Rivers, Trails and Conservation Assistance Program of the National Park Service. For further guidance or for items not addressed in the following consult the references below and/or the current information available on the internet.

BEST MANAGEMENT PRACTICES

The National Park Service developed 7 Best Management Practices for water trails. Since they reflect precisely what SCLT strives to do, SCLT has adopted these as our water trail objectives. Along with providing a framework for our planning and development efforts, they also document our intensions, vision and desired outcome.

1. **RECREATION OPPORTUNITIES.** The water trail route has established public access points that accommodate a diversity of trip lengths and provide access to a variety of opportunities for recreation and education.

2. **EDUCATION.** The water trail provides opportunities to learn about the value of water resources, cultural heritage, boating skills and outdoor ethics.
3. **CONSERVATION.** The water trail provides opportunities for communities to develop and implement strategies that enhance and restore the health of local waterways and surrounding lands.
4. **COMMUNITY SUPPORT.** Local communities provide support and advocacy for maintenance and stewardship of the water trail.
5. **PUBLIC INFORMATION.** The public is provided with accessible and understandable water trail information, including details for identifying access and trail routes; cultural, historic and natural features; hazards; and water quality. The water trail is promoted to the community and a broad national audience.
6. **TRAIL MAINTENANCE.** There is a demonstrated ability to support routine and long-term maintenance investments on the water trail. Facilities are designed, constructed and maintained by incorporating sustainability principles.
7. **PLANNING.** An applicant must also incorporate and maintain a water trail plan that describes a vision, desired future conditions, and strategies to strengthen best-management practices.

SCLT WATER TRAIL GOALS

In following with the above criteria, future goals for SCLT Water Trails are-

- Host annual water trail related events or projects.
- Endorse a water trail based learning component with local schools and educational entities.
- Grow local support and develop relationships with officials, advocacy organizations, paddlers, visionaries and citizen with resources and tools to engage.
- Launch and grow stewardship programs.

WYOMING'S WATER LAWS

With Wyoming water laws being what they are, SCLT has worked hard to provide access. Communicating the particulars to water trail users has been a part of the mission since its conception. Signage at the access points and the use of various media outlets stress the importance of respecting adjacent landowners. A brief description of Wyoming's water law is given here, and since SCLT's water trail borders Montana, with the navigable waters flowing from one state to the other, Montana is included as well.

The Wyoming Constitution provides that water of all natural streams, springs, lakes, or other collections of still water be the property of the state. If a stream can be used by a watercraft, it is accessible to be floated by the public. However, the public does not have access to the streambeds, banks or islands when the water is on private land. Users are not to wade or walk without permission. Doing so is trespassing. You may only float across private land on navigable water. You must stay in your boat at all times unless permission has been obtained. State law does however allow you to leave your craft for short portages around non-navigable obstacles.

As in Wyoming, under the Montana Constitution, all waters of the state are owned by the state for the use of its people, establishing a public trust. However, in Montana, if a waterway is capable of

recreational use, the public may use it, regardless of navigability or streambed ownership. As long as you enter a stream at a legal access point, you may float or wade the streambed up to the high watermark.

SUPPORTING GUIDELINES AND STANDARDS

Many of the guidelines and standards regarding planning and development of water trails are similar to that which is employed for terrestrial trails. To avoid redundancy, only those things directly related to water trails, and those that may lend insight when considered through the creation of water trails, will be included. As in the material presented above, the following endeavors to provide us with consistency and to give us direction, but due to the nature of this business, it is a work in progress. SCLT will remain flexible to learn and grow as we continue to develop our water trail program.

PRINCIPLES OF LEAVE NO TRACE

These minimum impact ideas apply to all who enjoy the out-of-doors and deserve to be listed here as one of our guiding principles. To protect not just land based resources but also our local water resources, the following underlie our communications, teachings and practices-

- Plan Ahead and Prepare
- Travel and Camp on Durable Surfaces
- Dispose of Waste Properly
- Leave what you Find
- Respect Wildlife
- Be Considerate of Other Visitors

CONNECTING WITH STAKEHOLDERS

As with terrestrial trails this is a critical step in the planning phase of a water trail. During outreach, and throughout the process, the following additional individuals and groups involved in water resources shall be considered:

<u>Water Resource Managers</u>

County water resource managers have a handle on the system drains, dams, and other man-made obstacles along a rivers course. They can provide valuable information on how water levels change, preferred method of navigating in and around structures, and can be a useful resource for informing new infrastructure decisions.

<u>Department of Environmental Quality (DEQ), U.S. Army Corps of Engineers, Land Conservancy and/or Conservation Districts</u>

These groups often have a role in managing water bodies and the associated natural resources. Natural resource managers often see the potential for stewardship and restoration that results from increased emphasis on waterways.

<u>Anglers</u>

A small group on Sheridan County waterways but engaging anglers can bridge divides that may occur between recreational paddlers and anglers.

<u>Property Owners</u>

As always, adjacent landowners are critical to development. Getting support early in the process greatly reduces conflict later.

CONDUCTING AN INVENTORY

Once the route has been identified, inventory of a water trail shall include the following steps:

1. Identifying all agencies and organizations currently working on, managing and/or planning for the water body.
2. Review relevant documents, reports, plans and programs that focus on the waterbody:
    - Public awareness programs such as those for invasive species, etc.
    - Land uses, zoning, watersheds, and connecting waters.
    - Clubs holding events or projects
    - Local recreation plans for parks, etc.
    - Historical information regarding the waterbody.
3. Compile physical and supporting attributes:
    - Access sites- existing and potential.
    - Hazards- may include swift water, flood areas, debris piles, and man-made structures.
    - Points of interest- historical, natural areas, unique flora or fauna, service amenities, etc.
    - Float times at different times of year and at various flow rates.

PLANNING WATER TRAILS

The following are general recommendations and actions centered on planning for a water trail:

Operations

- Creation of a Plan- formal documents such as this that provide framework for long-term development and management.
- Continue securing stakeholder support.
- Establish funding for program longevity.

Physical Improvements

- Access sites, portages, signage, fencing, camping and day use sites, restrooms, etc.

Stewardship

- Stewardship and program activities help keep the community invested and involved.

Brand Identity

- Addresses the development of a logo, trail maps, website, trail signage, etc.

MANAGING EXPECTATIONS AND ACCOMMODATING USE

Though not an issue at the writing of this document, SCLT recognizes that in the future, load limits may need to be considered. Load limits are the maximum number of visitors that a waterbody or access site can accommodate while still achieving and maintaining desired conditions, visitor experience, and resource protection.

IMPLEMENTATION

LAND ACQUISITION

Begins with making a connection then communicating intent whether through an official written proposal or through correspondence. The Public Access guide for Landowners and Water trail & River Managers put out by the River Management Society in conjunction with National Park Service should be examined prior to any undertaking. The guide provides valuable information for members who manage recreational access to water on privately held and public land, or who are negotiating with landowners for the privilege of doing so. It may also be useful to landowners who allow or are considering recreational access to and use of their property. This document can be found here: https://www.river-management.org/water-trails.

ACCESS DEVELOPMENT

When it comes to access sites, SCLT's goals are two fold- to support sustainable practices along the water trail, and to establish a positive paddling experience. Much has been published on guidelines for properly locating access sites for safety and protection of the environment. A brief outline is given below. For further information on the sustainability principles SCLT has adopted, refer to the National Park Service's Water Trail Toolbox at https://www.nps.gov/WaterTrails/Toolbox.

Site Location Considerations:

- Water body, shoreline, riparian vegetation
- Flow levels, currents, channel migration and changes in the bank over time
- Type of user, type of craft being launched, user experience
- Frequency of use, number of users at one time
- Stable surface for safe craft entry/exit, sufficient space to accommodate length of watercraft
- Environmental issues, riverbank and vegetation disturbance during construction/over time
- Regulation compliance

AMENITIES

A general rule of thumb for amenities at access sites is that the extent of the amenities shall be congruent with the surrounding environment in which the site is located. Recognizing that not all access site are created equal, parking, accessible launch/land areas and signage are the minimum requirements we strive for. If practical and space allows, staging areas are also considered. Where traffic is expected to be heavy, amenities such as restrooms, potable water, trash receptacles, and shelter may be considered. It is SCLT's goal to carry out all development in a manner that does not diminish the health of local waterways and its surrounding lands.

Parking:

To date, parking at each of SCLT's access sites either utilize existing previously developed facilities (South Park, Thorne Rider, Welch, etc.) or at the more remote sites, utilize undisturbed ground (Padlock, Sanborn Bridge). Any development will be undertaken in accordance with applicable governing laws related to environmental impact, vegetation and storm water management, etc.

Launches:

To date, all of SCLT's are natural surface launches along riverbanks, with no construction component. These launches are cost effective, require little maintenance, and have low environmental impact, due to the lack of construction. However, disadvantages such as inaccessibility due to water fluctuations, difficulty in navigating the area, and possible resulting erosion can occur. In response, SCLT monitors sites regularly, routinely conducts maintenance as spelled out below to keep users where intended, and encourages user feedback. Should a site become negatively impacted, appropriate measures will be undertaken. These may include for example, installation of geotextile mats, relocation or permanent closure of the affected site.

Signage:

As with our terrestrial trails, to preserve the visual quality of the natural environments in which our water trails pass, SCLT has adopted a policy of using signs sparingly where possible, and keeping signs neat and in character with their surroundings. SCLT's signs will be comprised of three levels: Network Kiosks,

Wayfinding Signs and Advisory Signs. Of particular importance on water trails are safety and risk signage at hazards such as diversion dams. Signs shall be designed to promote visibility without being obstructive.

Portages:

Portages are developed in order to carrying your craft over land, either around an obstacle, or between two bodies of water. At the time of the writing of this document, SCLT is actively engaged in securing right-of-ways and developing portages where necessary. For the most part the portages are small, with the only clearing of overhanging branches or debris to allow for a natural pathway through the vegetation, with the bank of the river is left undisturbed.

COMMUNICATION

Communication is key to success, education and safety. SCLT employs the following tools and resources to communicate and promote-

- A water trails page within SCLT's website that includes maps, specific information on access sites, known hazards, links to water conditions, etc.
- Media Outlets and Press
- Social Media
- Local Events
- Visitor Interaction

SAFETY

In addition to educational and informative communication shared through means outlined above, SCLT continues to engage in efforts to reduce the hazards along the water trail. These consist of mainly of community cleanup events and through on-going SCLT maintenance efforts. First Responders are kept updated with maps and are aware of the specifics of the routes, locations of access, hazards, and trail markings that might aid assistance.

SCLT WATER TRAIL MAINTENANCE STANDARDS

INTRODUCTION

On-going maintenance is integral to a successful water trail program. As with terrestrial trails, SCLT is dedicated to keeping each waterway in its charge safe, easily passable, clearly and consistently marked, with amenities functioning as intended to protect both the user and the environment. The Fundamentals of our Maintenance Program listed above are employed here also- Assessments, Stewardship/Volunteer Programs, User Education, Funding Strategies, and Goals. The recommended Maintenance Schedule, Frequency in which maintenance occurs, Maintenance Triggers, Maintenance Priorities, and Reporting and Logging Information applies here as well.

REGULAR ACTIVITIES

The following activities are specific to the water trails and are routinely employed when necessary. Physical condition, aesthetic appeal, and improvements are monitored and considered upon each visit by an SCLT personnel or trail steward.

- Mow and trim parking areas and boater ramps to keep visitors where intended
- Inspect all gates and fences at access sites to assure they remain in good operating condition
- Keep portages clear of blowdown and overgrowth

- Keep trash picked up
- Inspect area for vandalism
- Employ erosion control measures when necessary and in accordance with local waterway regulations

LOG JAMS, SNAGS AND DEBRIS DAMS

This deserves a category in itself since management of woody debris is an important aspect of water trails, particularly on rivers and streams. SCLT recognizes that woody debris is an important component of a stream's anatomy. It promotes stream health, provides erosion control, slows runoff, provides food and cover for aquatic creatures, and creates deep pools that provide shelter for a variety of fish. SCLT has adopted the "Clean and Open Method" developed by the Department of Environmental Quality and Department of Natural Resources to give specific guidance on to manage woody debris. It is not our intention to sterilize the rivers we steward, but to enhance them.

<u>THE CLEAN AND OPEN METHOD OF WOODY DEBRIS MANAGEMENT:</u>

1. **PLAN** – Address public health, legal access, safety concerns; define point of access to river; determine depth of water, flow and emergency plans.

2. **CLEAN** – Remove urban rubbish (man-made materials) and dispose properly.

3. **OPEN** – Move or cut loose floating debris to allow passage. Use a handsaw or chainsaw to make the opening wide enough to allow flow through the logjam.

4. **PLACE-** Excess woody debris shall be placed along steam banks and in the adjacent riparian corridor to create habitat.

5. **LEAVE-** Woody debris that is embedded in the stream's banks or bottom shall be left undisturbed.

6. **MINIMIZE- The** impact to the riparian corridor at the work site shall be kept minimal.

SCLT EQUESTRIAN TRAILS

INTRODUCTION

At the time of this writing, SCLT has ~4 miles of Equestrian trails at the Soldier Ridge Trail System (SRT), with another `3 miles being proposed for construction in 2020. Additionally, ~2 miles of equestrian specific trail, to get riders from the base to the top of the mountain, has been proposed on Forest Service property in conjunction with the Red Grade Trail System.

Members of the equestrian community continue to request trails that are sensitive to their needs and desires. It is SCLT's objective is to create these trails, making them safe and enjoyable for this type of use. Once created, as with all terrestrial trails, to extend the life of the trail and reduce its need for maintenance, education on the proper use by trail riders is necessary. Following these two simple rules is key to protecting the trails and the environment in which they pass- *stay on trail and don't ride when wet and muddy.*

As we move forward with equestrian trails, SCLT will encourage participation from the equestrian community with the aim of connecting users to what it takes to create and maintain trails. Through this we intend to foster stewardship and build the relationships necessary to achieve the trails objectives.

There are many equestrian elements to be considered- such as corrals, tread width, horse-friendly surfaces, classes of trails, agency-specific guidelines, etc. - that document will not go into. To obtain specifics on these as well as the specific design parameters related to each, consult the references below and/or the current information available on the internet.

REFERENCES

1. American Trails, Best Practices For Trial Management, Trails Management Manual, Maricopa County Parks and Recreation Department. (2018, May). Retrieved from https://www.americantrails.org/resources/best-practices-for-trail-management

2. American Trails, Design and Building, Continental Divide National Scenic Trailhead Design Guidelines, Retrieved from https://www.americantrails.org/resources/design-building

3. Bighorn National Forest Trails Strategy. (2005, January). Retrieved from https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd503282.pdf

4. Equestrian Design Guide Book for Trails, Trailheads and Campgrounds (USDA Forest Service Technology & Development Program) http://www.fhwa.dot.gov/environment/rectrails/trailpub.htm

5. Federal Highway Administration Recreational Trails Program, Trail Construction and Maintenance Notebook. (2017). Retrieved from https://www.fhwa.dot.gov/environment/recreational_trails/publications/fs_publications/07232806/toc.cfm#acknow

6. FIELD MANUAL ON MAINTENANCE OF LARGE WOODY DEBRIS FOR MUNICIPAL OPERATION AND MAINTENANCE CREWS. Clinton River Watershed Council. www.crwc.org/wp-content/uploads/LWD-Manual-Final.pdf

7. Guidelines for a Quality Trail Experience, Bureau of Land Management retrieved from https://www.blm.gov/sites/blm.gov/files/Guidelines-for-a-Quality-Trail-Experience-2017.pdf

8. Managing Mountain Biking, IMBA's Guide to Providing Great Riding (International Mountain Bicycling Association) (2004). Colorado: IMBA. Retrieved from https://www.imba.com/

9. Michigan Water Trails Manual http://www.michiganwatertrails.org/downloads/water_trail_manual_20170609_web.pdf

10. NATIONAL PARK SERVICE RIVERS, TRAILS, AND CONSERVATION ASSISTANCE PROGRAM. www.nps.gov/orgs/rtca

11. NATIONAL WATER TRAILS SYSTEM. www.nps.org/WaterTrails

12. Public Access Guide for Landowners, Water Trails & River Managers. https://www.river-management.org/assets/WaterTrails/landowner%20guidance_final_final_revised_1-21-2016.pdf

13. RIVER MANAGEMENT SOCIETY. https://www.river-management.org/water-trails

14. Trail Bridge Rail Systems, U.S. Department of Agriculture, Forest Service. Technology & Development Program. Retrieved from https://www.fs.fed.us/t-d/pubs/pdfpubs/pdf07232329/pdf07232329dpi72.pdf

15. Trail Fundamentals and Trail Management Objectives. U.S. Department of Agriculture, Forest Service. Retrieved from https://www.fs.fed.us/recreation/programs/trail-management/documents/trailfundamentals/1623-3801_TrailFdml%2BTMO_Sec508_11-14-16_150dpi.pdf

16. Trail Maintenance Manual, New York-New Jersey Trail Conference Inc., 7th Edition (2007). Retrieved from https://www.americantrails.org/files/pdf/NYNJ-Maintenance-Manual.pdf

17. Trail Solutions: IMBA's Guide to Building Sweet Singletrack (International Mountain Bicycling Association) (2004). Colorado: IMBA. Retrieved from https://www.imba.com/

18. USDA Forest Service Standard Trail Plans and Specifications. (2017, May). United States Forest Service. Retrieved https://www.fs.fed.us/recreation/programs/trail-management/trailplans/

19. USDA FSH 2309.18 - Trails Management Handbook. (2008, October) Retrieved from https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5403600.pdf

20. USDA Trail Construction and Maintenance Notebook. (2007, July) Retrieved from https://www.fs.fed.us/t-d/pubs/pdfpubs/pdf07232806/pdf07232806dpi72.pdf

21. WATER TRAIL PLANNING 101. Nation Parks Service – Rivers, Trails and Conservation Assistance Program. www.nps.gov/WaterTrails/Toolbox/DownloadFile/125

22. WOODY DEBRIS MANAGEMENT 101 - CLEAN AND OPEN METHOD. Friends of the Rouge via Huron River Watershed Council. ww.hrwc.org/wp-content/uploads/2013/03/Clean-and-Open-Method.pdf