Request for Proposals

Loops Renewal on the SHT: Split Rock River Loop

Issued: December 7, 2023

Proposals Due: January 8, 2024

The Superior Hiking Trail Association (SHTA) seeks proposals from individuals and businesses with expertise and extensive experience in rehabilitation/renewal of existing hiking trail according to modern, sustainable construction techniques and standards, including, but not limited to: clearing; building tread; installing puncheon and boardwalk; using local, on-site stone to build retaining walls, steps, and other trail improvement features.

About the SHTA and the Split Rock River Loop:

The SHTA is a non-profit organization tasked with the maintenance and renewal of the approximately 320-mile long Superior Hiking Trail that follows the rugged terrain along Minnesota's north shore of Lake Superior from the Wisconsin border at its Southern Terminus to the Canadian Border at the Northern Terminus.

The Split Rock River Loop is located almost entirely within Split Rock River State Park just south of Silver Bay, MN. It is a popular loop trail, approximately 4.5 miles in length, although the ½ mile spur down to Highway 61 on the east side of the loop is not included in the scope of this project. The bridge at the far northern end of the loop has been missing for over 5 years, but its replacement is also not part of this project.

The project will be broken down into three separate locations: the spur, which leaves the wayside parking lot on Hwy 61 and travels to the intersection with the main SHT at Strand Creek, and is ½ miles long; the west side of the loop, which consists of the intersection with the spur at Strand Creek up to the crossing location of the Split Rock River, and is just under 2 miles; and the east side of the loop, which starts at the river crossing and continues back towards Highway 61 until it intersects with the State Park Spur Trail that leads down to Hwy 61, and is about 1.6 miles long. The final spur down to Hwy 61 on the east side of River is about .5 mile long, no maintenance will be performed there.

The SHTA is seeking approval and support from the DNR and Split Rock State Park to close the Split Rock Loop for the 2024 season. This closure would include the west and east legs of the trail, but NOT the west and east spur trails that lead back to Highway 61. These would remain open as part of the reroute for thru-hikers, section-hikers and some day use.

About the Project:

This project is primarily focused on the rehabilitation of existing, worn out tread (reshaping, installing drainage), replacement of worn out puncheon, boardwalk or stairs, or installation of new structures. Much of the existing trail is located on hillsides that have a heavy clay content and are prone to seepage, leading to perennially wet trail conditions, especially on the west side. In locations where boardwalk or similar structures were installed, they tended to sink in the soft soil, tilt, and slowly slide downhill. It is extremely important that installed structures stay in place and level from side to side. (Some rise and fall of structures is allowable to follow the natural contours of the land, but should typically not exceed 8 inches over 8 feet of length). Many locations will require uphill ditching and drains, possible even if structures are installed.

Tread repair involves reshaping the tread to facilitate the flow of water across the trail and the movement of people along the trail. This includes but is not limited to: removing slough and berm; cleaning drains that have filled in or installing new ones where needed; uphill ditching and cross drains; mitigating rocks, roots and stumps that hold water and impede traffic; and defining the trail where it has widened for various reasons

Due to the heavy use in this area, consider the construction or definition of “pull-off spots” that allow people to move aside to facilitate passage of other users. Logical locations for these features would be at the top, bottom, or possibly the midpoint on a hill, or at either end of a long structure. These could be identified during the pre-construction site visit.

There is a map with data points provided that shows all the major problem areas along the loop that need to be addressed, along with a spreadsheet with proposed solutions. **These are the project deliverables.** Some of the recommendations have already been addressed (colored bright green in the spreadsheet), but they were left in for reference. Where structures are to be used, the type and length is specified, although the type of structure is negotiable, as long as it meets or exceeds the plan. As stated before, the trail is within a state park and very heavily used, and all work must be completed to the highest standards for safety and longevity.

Puncheon and boardwalk on the west side should be between 36” to 40” wide, and 32” wide on the east side. All puncheon and boardwalk should have about 6” of clearance from the ground to the bottom of framing. Timber steps should be a minimum of 36” wide, greater widths are specified in certain locations. Step height should range from 7” - 8” high.

Please include material costs (lumber, hardware, etc.) with your proposal.

A portion of the proposed work is awaiting approval by the DNR but is currently under review, this includes one short (about 230 feet long) reroute proposed near the far northern end on the west side and three reroutes on the east side (50’, 165’, and 50’). SHTA requests that your quote breaks out the cost of these individual projects due to their contingency status.

The reroutes must be built with a finished tread width of 24 to 36 inch, full-bench construction, with a cleared corridor width of approximately 36 inches on either side of the center of the trail, for a total cleared width of 72 inches, or six feet. Trail can be roughed in with machinery, not to exceed 48-inch track width, but must be finished with a hand crew.

Timeline for Completion:

It is expected that the entire project will be completed during the 2024 construction season, which is approximately June-September in northern Minnesota. We will accept proposals for the entire project, but we will consider west side only proposals and east side only proposals if you are unsure of your ability to complete both sides in one season.

Access for the Project:

Currently, there are no alternative access points for bringing in materials or crew transport. The SHTA is exploring and seeking approval for other access points, and

although nothing has been approved yet, it is anticipated that there will be additional access points. These will be shared when and if permission is granted.

1. West side: The currently approved access is from the Wayside parking lot on Hwy 61, using the half-mile long spur trail to the intersection of the main SHT at Strand Creek. Steep stairs on both sides of the creek along with the bridge will make mechanized transport beyond this point difficult.
2. East Side: Follow the spur trail that comes down to the Highway (no parking at this location) up to the stairs (about ½ mile). There is a short bypass around the east (right side) of the steps. Once at the top, the trail is pretty wide and flat, it may be possible to transport using an ATV, or other small machine.

Rehabilitation of Old Trail and Removal of Materials:

It is expected that all the old material on the trail should be hauled out and disposed of. There is about 142' of puncheon, 62 three foot long 3x5 timbers and about 72' of puncheon on the east side that need to be removed.

Where reroutes are built, the old trail should be rehabbed to prevent further damage and closed down to prevent use.

Specifications:

1. **Duties and Responsibilities of Contractor.**
    1. Contractor is expected to possess the necessary experience, skills and craftsmanship to renew and/or build high quality and sustainable natural surface hiking (or experience with similar) trails meeting or exceeding accepted industry standards.
    2. Contractor is expected to possess the necessary experience, skills and craftsmanship to construct and install trail hardening structures such as puncheon, boardwalk, stairs, etc., with lumber or other materials intended to take the place of lumber (fiberglass or other composites, etc.) or stone.
    3. Contractor, crew, and any subcontractors associated with this project are expected to conduct themselves in a professional manner at all times.
2. **Field Layout and Design.** Where reroutes are proposed, they have been carefully laid out and flagged, but some minor adjustments may be permitted. If the contractor has any questions regarding the proposed alignment, they must discuss this with the SHTA prior to making any changes. If the contractor deviates from the established route, or outside any agreed upon buffer without permission, they may be required to fix the work without additional compensation.

    1. Corridor width shall be 6 feet wide, or 3 feet to either side of the centerline, and 8 feet high.
    2. Contractor should try to preserve large trees (8+” DBH) within this corridor and move the trail around them if possible
3. **Structure Construction (lumber).** Structures will be constructed using quality materials, built to withstand high use and the ravages of the elements. Substructure lumber (sills, stringers, posts, headers, etc.) will be treated, while preferred decking material is rough-sawn, and can be treated or natural. The design shall be simple and easy to maintain. Structures should be built to remain sturdy and level over time and through changing seasonal conditions. They must not obstruct the natural flow of surface water, and should have, on average, at least 4 to 6 inches of clearance between the bottom of the framing and the ground. SHTA will provide design specifications and plans for all wooden structures (puncheon and boardwalk) that are SHTA-preferred methods of construction. Other styles or construction methods are permissible (if they meet or exceed the standards of the designs provided) but must be discussed with SHTA prior to construction.
    1. **Puncheon** is defined as having a sill on the ground which supports two stringers that run with the direction of travel. The decking is laid on top of the stringers, perpendicular to the direction of travel.
    2. **Boardwalk** is defined as a structure that is supported on two upright posts that are connected with a horizontal ledger. The posts have a wide foot attached to the bottom that carries the weight of the structure over soft or saturated soils. The frame sits on top of the ledger, and the decking is attached to the frame, which is perpendicular to the direction of travel.
    3. **Timber steps** are typically constructed with 6x6s and consist of a riser (front) and two side pieces that are dug into the hill. The pieces are lap jointed and pinned together. The center is filled with native material if suitable soil can be found, otherwise they can be decked with wood.
4. **Site Meeting/Visits.** Contractor will participate in an on-site construction meeting with the SHTA to discuss the project prior to commencement of work. SHTA will perform regular site visits as the project continues. Contractor needs to schedule a meeting with the SHTA any time there is uncertainty with the project.
5. **Trail Construction.** Contractor and all crew members shall be required to be knowledgeable of and have proven capability of meeting or exceeding the trail building standards as defined in the MN DNR’s Trail Planning, Design, and Development Guidelines along with all general standards and conditions defined in this RFP or otherwise adopted for this project prior to and during construction. Specifics include:

1. **Trail building techniques.** The Contractor is expected to be fully versed in the techniques used to build sustainable hiking trails; this includes, but is not limited to, understanding and applying rolling grades, inslope/outslope tread, knicks, grade reversals, rock armoring and trail hardening (including wooden structures), climbing/descending turns, water diversions, etc.
2. **Trail grades.** Grades shall not exceed guidelines as defined in referenced manuals, typically not exceeding ten percent (10%), unless approved by the SHTA. All trail grades must be sustainable, as determined by the Contractor.
3. **Surface water control features.** The trail shall use rolling contour or grade system, with the trail traversing hills or side slopes and incorporating natural grade reversals (which are typically required every 20 feet to 50 feet. If a grade reversal is not feasible, other surface water drainage structures at the same frequency to minimize the effects of water flow and erosion shall be required, such as rolling grade dips and knicks; the Contractor is expected to be fully versed in trail building techniques commonly used to prevent trail erosion and ensure long-term sustainability.
4. **Trail Construction in Flat Terrain.** Where the trail needs to be constructed on flat ground, Contractor needs to take added and adequate measures (trail hardening, including, but not limited to: boardwalk, stonework, or elevated tread and/or ditching) to ensure that the trail is sustainable and wetlands are protected.
5. **Tread Construction.** The Contractor shall typically follow these basic steps to construct a **full bench** cut sustainable trail, including:
    1. **Excavating the tread**. Cutting the entire specified trail width into the side slope; excess soil shall be broadcast down slope of the trail (failure to disperse material down slope and away from the trail tread will not be allowed).
    2. **Cutting the backslope.** Backslope shall be compacted and naturally blend into the slope above the trail; maximum backslope shall be at natural angle of repose, but not exceed 45-degrees angle unless approved by Construction Manager.
    3. **Outslope the tread.** Typically 5 percent to ensure proper sheet flow of water across the trail tread, rather than down the trail tread; where the existing surface sideslope is less than 5 percent, the outslope shall conform to the existing sideslope; removed material shall be broadcast down slope of the trail in a thin layer; the critical

point where the trail tread meets the downhill slope shall be rounded and well compacted.

4. **Fine rake and compact the tread.** The entire width of the trail tread shall be evenly raked and then compacted by mechanized equipment furnished by the Trail Builder; soil compaction shall be completed with adequate soil moisture content to ensure proper compaction; fine raking shall leave the trail tread flat and even, with no areas for water runoff to pocket.
5. **Finish the tread and trail corridor.** Remove any flagging and broadcast organic material originally raked off of the trail tread location down slope over the loose soil from the tread excavation; 'leave no trace' principles will apply; the area adjacent to the trail shall be restored to appear undisturbed; restoration of disturbed areas shall include but not be limited to raking and leveling disturbed soil adjacent the trail tread, spreading leaves and other similar organic material over exposed soil, and removing all evidence of construction and equipment.

6. **Mechanized Equipment Best Practices.** It is the intent of the SHTA to minimize the impacts of construction, especially mechanized equipment. As such:
    1. All equipment will be clean and free of debris before being introduced to the work site. Equipment is subject to inspection at the start and during the project.
    2. All mechanized equipment shall be in good mechanical condition, free of any fluid leaks and be equipped with spark arrestors if applicable.
    3. Each machine will be equipped with a readily accessible fully charged fire extinguisher.
    4. Machine service and fueling is not permitted with 500 feet of a wetland or drainage.
    5. A spill kit suitable for five gallons of fluid will be onsite and within 500 feet of mechanized equipment whenever equipment is being operated.
    6. Using mechanized equipment equipped with tracks is strongly recommended. All track marks will be raked smooth and affected areas will be finished to have a natural shape, e.g., spoils piles rounded, smoothed and cleared of significant brush, blade edges blended.
    7. Scarring of trees within and outside the corridor is to be avoided.
    8. Machine access is restricted to the trail corridor, separate access routes may only be created and used with prior written permission of the SHTA. Any approved access route must be retired and reclaimed back to its original condition upon project completion. Any proposed turnarounds

shall be approved prior to construction and must be retired and reclaimed back to its original condition upon project completion.

Any equipment that does not meet these criteria shall be shut down until in compliance. If not correctable, it will be removed from the project site at the request of the Owner and at no additional cost to the Owner. As part of their bid package, the contractor will be asked to supply the expected list of mechanized equipment required to complete the project.

6. **Performance and Progress Assessment.** If the SHTA feels that the project is not moving according to schedule, or that the work is not up to industry standards, the Contractor will be notified and must take steps to remedy the matter. If improvements are not made satisfactorily, the SHTA reserves the right to remove the Contractor from the project.
7. **Quality Control and Crew Expectations.** As previously defined, the Contractor shall employ workers skilled and experienced for the specific task required. The Contractor and crew leaders are responsible for the performance and professional manner of all crew members. Any crew or crew member acting in a nonprofessional or inappropriate manner that jeopardizes the health, safety and welfare of other crews working on the site, or the public at large, will be cause for dismissal of that member or the entire crew, at the discretion of the SHTA. Failure to immediately address such issues may be cause for cancellation of the contract.
8. **Backcountry Protocol/Safety.** The Contractor and crew members shall be familiar with backcountry operation and safety protocols as well as be familiar and adept at “leave no trace” practices. Cell reception is spotty. Having back-up communication and navigation devices is strongly recommended. Contractor is responsible for providing all necessary Personal Protective Equipment. Crew members operating machinery or a chainsaw should work in close proximity with at least one other person. Each crew should have an OSHA-compliant first aid kit readily available.
9. **Construction Facilities and Site Protection.** The Contractor is responsible for maintaining the work site in a safe and responsible manner. This includes erecting and maintaining fences and barricades when necessary to provide adequate protection for their own and other crews, and other authorized project members. The Contractor shall secure, properly cover and protect his own equipment, materials and work against damage of any kind until this project is complete and the SHTA takes possession. The Contractor shall maintain a neat and orderly job site and shall promptly remove all debris and dispose of the debris legally off site. The Contractor shall remove all temporary fences, barricades, signs, etc. upon completion of the work.

10. **Tree and plant protection.** The Contractor shall protect trees and root systems outside of the defined trail tread, front slope, and back slope area from damage from construction equipment or damage due to soil compaction. The Contractor shall erect snow fences or flagging around any trees or plants designated by the SHTA to be protected or at other locations as directed.
11. **Working with Volunteers.** Volunteers may be involved with this project in some capacity; the Contractor must indicate whether they are willing and able to work with, or supervise, volunteers, and how that affects bid pricing.

Invasive Species Prevention

Contractors must follow Minnesota DNR's Operational Order 113, which requires preventing or limiting the introduction, establishment and spread of invasive species during activities on public waters and DNR administered lands. This applies to all activities performed on all lands under this grant-funded contract and is not limited to lands under DNR control or public waters. Duties are listed under Sections II and III (p. 5-8) of Operational Order 113 which may be found at: http://files.dnr.state.mn.us/assistance/grants/habitat/heritage/oporder_113.pdf.

Prevailing Wage

All State funded or partially State funded work against this contract is subject to the prevailing wage requirements pursuant to Minnesota Statutes 177.41 to 177.44 and corresponding Minnesota Rules 5200.1000 to 5200.1120 as established by the Minnesota Department of Labor and Industry. Specifically, all contractors and all tiers of subcontractors must pay all laborers and mechanics the established prevailing wages for work performed under the contract. Failure to comply with the aforementioned may result in civil or criminal penalties. The Department of Labor and Industry has a web page with Frequently Asked Questions about prevailing wages at:

http://www.dli.mn.gov/business/employment-practices/prevailing-wage-information.

Labor Codes applicable to this project, taken from the **Highway/Heavy** wage rates (for the most up-to-date information on wage rates, please visit https://workplace.doli.state.mn.us/prevwage/highway_data.php?region=01. Complete job description can be found at: https://www.revisor.mn.gov/rules/5200.1101/ and https://www.revisor.mn.gov/rules/5200.1102/):

- As of April 4, 2023 these job descriptions and wage rates apply:
    - **101 – Laborer, common:** Loading, unloading and staging construction materials; clearing and grubbing with hand tools; using a chainsaw to clear trees and brush; removing materials to be discarded.

        - Basic Rate: 35.53 Fringe Rate: 22.67 Total Rate: $58.20
    - **703 – Bricklayers (includes stonemasonry):** Laying all riprap, rubble work, with or without mortar, setting all cut stone, marble, slate, or stone work.
        - Basic Rate: $31.83; Fringe Rate: $35.32; Total Rate: 67.15
    - **704 – Carpenter:** Constructing, erecting, installing, and repairing structures, structural members, and fixtures made of wood, plywood, and materials that take the place of wood, such as metals, composites, and fiberglass, using carpenter hand tools and power tools.
        - Basic Rate: 38.21 Fringe Rate: 27.58 Total Rate: $65.79
    - **313 – Hydraulic backhoe (track or wheel mounted):** and/or similar equipment with shovel type controls up to 3 cubic yards including all attachments.
        - Basic Rate: 42.81 Fringe Rate: 25.00 Total Rate: $67.81

If the contractor anticipates performing tasks that are not covered by this list, please contact the project manager (SHTA).

The contractor must also submit Department of Labor certified payroll forms with each invoice
(forms can be found at:
https://www.dli.mn.gov/sites/default/files/pdf/pw_certified_payroll_form.pdf)

For questions regarding the Prevailing Wage Laws, contact the Department of Labor and Industry at 651.284.5091.

Please include the following information with your proposal:

1. Cost estimates for the project, broken down into mobilization, labor, materials, travel and lodging. If you have a fixed cost for structure construction that lumps labor and materials together, that is fine, just specify that this is the case.
2. Labor costs should be broken down into:
    1. Bringing in materials for puncheon,boardwalk, stairs, etc.
    2. Structure construction (puncheon boardwalk, stairs, etc.)
    3. Tread rehab
    4. Tree and brush clearing and removal on reroutes, if this is an additional cost
    5. Construction of proposed reroutes
    6. Removal and disposal of approximately 214’ of old puncheon and about 75 chunks of landscape timbers
    7. Decommissioning/closure of the old trail where the trail is rerouted
3. Your availability, or potential start date.
4. Your qualifications for performing rehabilitation to a natural surface trail and constructing durable structures, and your past experience building and

maintaining hiking trails or other recreational trails, including creating accurate cost estimates.

5. Documented evidence (photos, organizational newsletters or other material) of trail construction or repair projects you have overseen or participated in.
6. At least two references from customers of your work. (If you work for a nonprofit organization, please provide testimonials or references from volunteers who have worked with you.)
7. A list of all equipment (make, model, year and width) that will be used on this project must be submitted with bid for approval.
8. A list of all equipment operators with hours of experience on each piece of equipment must be supplied with your bid.

PLEASE SUBMIT YOUR PROPOSAL NO LATER THAN January 8, 2024. If your proposal is selected, contract details can be made final following your on-site review of the project, if needed.

Send Proposal, or questions to:

Tamer Ibrahim, Trail Operations Director
Superior Hiking Trail Association
tibrahim@superiorhiking.org
218-370-8393

“Funding for this project was provided by the Minnesota Environment and Natural Resources Trust Fund as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR)”

Sequence	Action Needed	Notes
	Spur Trail (West Side)	
1	Deberm 40' & Install 2 Water bars	On hill leading out of parking lot
2	Armor Side Of Staircase & Install Drainage Dip, Remove Old Drain	Or install with new, wider stairs (4-5' wide)
3	Armor Side Of Staircase & Install 5 more Steps At the Bottom	Or install with new, wider stairs (4-5' wide)
4	Replace Culverts With Drainage Dip	
5	Armor Side Of Steps & Install 1 More Step at the Bottom	Or install with new, wider stairs (4-5' wide)
6	Install 15' Ditch Leading To Culvert & Replace Culvert With Rock Water bar, De-berm.	
7	Install 3 Wood Box Steps, 4-5' wide	
8	Redo Water bar To Proper Angle	
9	Install Drainage Dip, 100' Of Drainage Ditch With Pipe To Culvert & Gravel	
10	24' Deck Bridge On Pans In Middle	Clean Dirt from uphill side, install uphill ditch, maybe elevate structure
11	Install Drainage Dip	
12	Repair and Reshape Water bar, De-berm uphill	
13	Relo 10' (river side)	
14	100' Step And Run Elevated Boardwalk On Pans	Or 100' uphill ditch, cross drains and gravel
15	Extend Wooden Box Steps 65' Up The Hill, 4-5' wide.	Down to the top of existing staircase, provide nice landing with Drainage
15a	Install 15' Wooden Box steps up the southbound Main Trail from intersection.	NOT part of Spur or Loop
	West Trail	
16	Install Wooden Box Steps 100' (~35), 4-5' wide	Current structure, 30'L x 2'W timber c-steps needs to be removed
17	Install 4 Water bars, Remove roots and Re-bench	
17a	Uphill ditch and drains, 60'	
18	Install 170' Of Step And Run Elevated Boardwalk On Pans	
19	Deberm And Open Dips	
20	Replace Stone Steps	Unlikely to find enough stone, 100' of box steps if necessary
21	Install 90' Step And Run Elevated Boardwalk On Pans	
22	Install Drainage Dips Or Water bars For 150' (or 190' Of Elevated Boardwalk)	Most likely need to install elevated boardwalk
23	Install 260' Elevated Boardwalk On Pans	Will need sturdy handrail on Downhill (river) side
23a	Install 75' Of Puncheon	
24	Install 120' Step And Run Elevated Boardwalk On Pans	
25	Replace 100' Of Puncheon	
26	Install 124' Of Elevated Boardwalk On Pans	
27	Install 30' Of Step And Run Elevated Boardwalk On Pans	
28	Install 30' Of Elevated Step And Run Boardwalk On Pans	Possibly a natural crossing at drainage with slight realignment for best crossing
29	Rebuild Tread (chop Roots)	
30	Build 90' Rock retaining wall & Backfill To Cover Roots	Probably Not enough rock onsite. Use lumber, will need borrow pit for fill
31	Rebuild & Extend Rock Staircase 70'	Probably Not enough rock onsite. Box steps 95'
32	Rebuild 50' Tread & Install 2 Drains	
32a	Use Rock and Lumber to Install Checks, 50-60'	
32b	40' box steps, then Rebuild Tread and Cut Roots and Fill, 40'	
33	Install Drain & 2 Water bars & Deberm	
34	Replace 20' Bridge (add 40" roughsawn decking with Bull Rail)	
35	Install Drainage Dip, Reshape Trail, 4 Water bars, & 20 Wood (Box) Steps	
36	Relo & New 40' Bridge Or Elevate Existing Bridge & Install 80' Rock Steps	
37	Install Rock Steps 60'	
38	Install 2 Water bars and add Checks to the Top of the Hill, Remove Roots	Use Stone if Present
39	Install Drain	
40	Deberm And Drain	
40a	Rearrange Rocks into Checks/Steps	
41	Replace Wooden Stairs With Wood Box Steps 122' (41 Steps)	
42	Install 2 Drains	
43	Install 20' Retaining Wall & Reshape Tread	
44	Install 2 Wood Steps	
45	50' Puncheon	
46	Install Drain & Reshape Trail	
47	Install 100' Wood Box Steps (30 steps)	
48	Install 50' Rock Steps	Likely need Box Steps, very Steep Section
49	Split Rocks & Potential Rock Quarry	
50	Install 20' Box Steps (7 steps - $340) & 64' Puncheon ($830) Or Relo	Relo is preferred option (pending approval), will bypass points 50&51
51	12' Puncheon	
52	Install Drain	
53	Repair Existing Puncheon & Extend 25'. Join Sections	Made up of 5 individual sections that are 10' long with a 25' long gap in between. Add 25' puncheon to the middle and connect all sections together.
	East Trail	
54	Install 50' Puncheon	

55	Define / Widen Tread.	
56	Replace Ramp With 30' Step And Run Elevated Boardwalk, and puncheon with 30' elevated boardwalk	Provide drainage above, fill and rebuild tread among roots leading down to structure
57	Install 5 Check Steps & Waterbar	
57a	Build short (~50') reroute about 10' uphill to move trail away from the edge of a cliff.	Pending approval
58	Relocate 72' Of Eroded Trail To Join Privy Trail Or 24 Wood Steps. Reroute preferred option, about 165'.	Pending approval
58a	Install about 24 box steps down to campsite	As time and budget allows
59	Rebuild 12' bridge with 3@2x10x12 stringers, 3' wide. Location is good, will need to build cribbing on south side about 2' high to make level	
60	Place Crush & Fill 35'	
60a	16' puncheon/bridge on sills.	
61	Install 100' Of Puncheon	
62	Use Rock to build steps and drains. Define stream channel to keep water from flowing down trail. Build short relo (40-50') to avoid fall line section near the top.	
63	Re-Align Rocks In Stream (to create a channel to facilitate better flow and minimize erosion of trail)	
64	Install 166' Puncheon	
65	Install 124' Puncheon	
66	Dig Two Trenches Across Trail Or 16' Puncheon	
66a	Intermittent stream flows across trail, define stream channel and harden trail if necessary	
67	Install 2 Drainage Ditches	
68	Install 96' Puncheon	
68a	Provide better drainage and harden or add 35' puncheon	
69	Install 2 Drains	
70	Install 2 Rock Water bars	
71	Install 4 Drains	
72	Install 2 Drains	
73	Install 200' Puncheon	
74	Install 3 Water bars & 2 Drains	
75	Install 130' Puncheon	
75a	Install 2-3 drains	
75b	Use big rock in stream, add a rock to either side to create natural crossing	
75c	Improve natural crossing	
76	Install 80' Puncheon	
77	Other end of 76	
78	Install 3 Drains	
79	Perform routine maintenance, or install 32' Puncheon	
80	Install 5 Check Steps & 2 Water bars	
81	Install 2 Drains above staircase. Add a 6' long ledger to the top of stairs and backfill	

Color Key, Action Necessary:

Reroute	
Bridge	20' (west side), 28' (east side)
Treadwork (Re-bench, De-berm, Ditches and Drains/Dips, Fill, Remove Roots)	
Elevated boardwalk on pans	924' (west side), 60' (east side)
Puncheon	262' (west side), 816' (east side)
Rockwork (stairs, retaining wall)	
Wooden stairs (box steps)	447' (west side)
Completed!	
Micellaneous	

Color Key, Trail Sections:

West Spur
West Loop
East Loop