**Southeastern Cave Conservancy (SCCi)**

*Stephens Gap Cave -- Permanent Fixed Rope Management Plan*

**Purpose**

The purpose of this document is to detail the location, description, and reasoning behind the installation of permanent fixed rope(s) and corresponding hardware in caves on SCCi preserves. Since they are to remain in the cave for perpetuity, potential hazards that would affect their physical condition and safe use in perpetuity must be identified and mitigated when possible. A robust periodic inspection plan shall assess their physical condition, and results will be documented. Special attention shall be given to areas where hazard(s) cannot be mitigated. Should a concern about the physical condition of a fixed rope and/or hardware be identified during inspection or from a preserve visitor report, this document will detail repair and/or replacement methods for any foreseeable situations. All ropes and hardware will be replaced periodically no later than the stated service life of their respective manufacturer.

**Inspection Checklist**

1. *Inspect entire rope length for sheath abrasion or damage*
2. *Inspect knots to ensure they are proper and secure*
3. *Verify screwlinks are screwed closed and tight; tighten if loose, replace if open*
4. *Verify bolts and bolt hangers are not loose; tighten if loose. If rock decay is the reason, bolt replacement in new location is required*
5. *Inspect all hardware for corrosion*
6. *If present, inspect webbing for abrasion and damage, and verify knots are secure and proper*

**Potential Hazards List** *(non-exhaustive)*

Rock/rope abrasion Age

Waterfall/rope abrasion Dynamic fall from user

Abrasion from use Cave animals

Rock fall Chemical exposure

Moisture corrosion Rock decay

Galvanic corrosion

**Overview**

**CAVE NAME:** Stephens Gap Cave

**PRESERVE:** Stephens Gap Cave Preserve

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Location | Description | # of bolts | # of ropes | Height/length | Install Date | Inspection frequency |
| 1 | Approach to third drop in pulldown route | Safety/traverse line | 4 | 1 | ~25 ft | 10/14/2022 | 1 yr and after major flood events |

***Location 1 – Pulldown route traverse line***

*Description: 2*5 ft traverse line secured toa pulldown ring connected to two ½-in diameter bolts with chain on the upper end, and connected to an identical pulldown ring assembly at the lower end. The lower pulldown ring is also the anchor for the third drop.

*Rationale:* This rope was installed at the approach to the third drop in the popular, short, pulldown route. The passage is relatively narrow with smooth walls (no natural anchors) and becomes steep as the drop is approached. The stream in the passage is seasonally deep and fast-moving which may become a hazard (someone could be swept over the 30-ft drop). Use of the line may not be necessary in low water conditions. There should be enough slack in the line to allow someone to rappel down to the rig point if necessary. Otherwise, if the line is used, a connector or ascender may be used as a safety.

*Hardware Specifications*

Two ½-in x 5-in 316 SS wedge bolts with 316 SS chain and ring at both ends of the traverse

*Rope Specifications*

11mm nylon static kernmantle, approx. 30 ft long

***Hazards Identification***

|  |  |  |
| --- | --- | --- |
| **Hazard** | **Identified?** | **Notes/mitigation efforts** |
| Rock/rope abrasion | Yes | Line runs along passage wall and may abrade in high water if not pulled taut by last person down on each trip |
| Waterfall/rope abrasion | No | No waterfalls close enough to abrade rope |
| Abrasion from use | Yes | Moderate traffic area, some wear from use is possible |
| Rock fall | No | No loose rock overhead of rope or bolts |
| Moisture corrosion | No | All bolts are corrosion resistant 316 stainless steel. Nylon ropes lose about 15% of rated strength when wet, but are still within safe working load (SWL). |
| Galvanic corrosion | No | Only stainless steel hardware used. |
| Age | Yes | Indefinite lifetime on hardware. 10 year maximum lifetime on nylon ropes per most manufacturers |
| Dynamic fall from user | Yes | Static ropes can be damaged from dynamic falls. Traverse line would experience this if a visitor fell while attached to it |
| Cave animals | No | Rope location is not reachable by animals known to chew on ropes, like pack rats or mice |
| Chemical exposure | No | No chemical exposures expected |
| Rock Decay | No | Good rock quality; issues not expected |

**Inspection Interval: 1 year or after major flood event**

Due to its location in a moderate traffic area, abrasion from use is possible. In addition, if the line is not pulled tight by the last person in a group it can hang down into turbulent floodwater in the narrow, steep passage immediately above the third drop. Therefore, this fixed rope should be inspected at least annually, or after a significant flood event, or after receiving any report of damage from a preserve visitor.

**Repair/Replacement Considerations**

Should any part of this fixed rope system need to be repaired or replaced, it can be accessed via the full pulldown route from Entrance 5, or shortcuts via E4 or E5.

**Southeastern Cave Conservancy (SCCi)**

*Permanent Fixed Rope Inspection Report*

Cave Name: Stephens Gap Cave

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Location** | **Rope Install Date** | **Hardware Install Date** | **Designated Inspection Interval** | **Last Inspection Date** | **Rope Replacement Date** | **Hardware Replacement Date** |
| **Pulldown route traverse (3rd drop)** | 10/14/22 | 9/23/15 | 1 year | 10/14/22 | 10/13/32 | N/A |

Inspection Reports:

2015-2022 – Qualified cavers completing the pulldown trip were queried about condition of the traverse line at least quarterly, and it was replaced two times due to damage caused by abrasion. The second replacement line was shortened to reduce the chances of it hanging in floodwater.

10/14/2022 – Minor abrasion noted at lower anchors; traverse line replaced by Ron Miller.