Details of a Wilderness Trail Repair Project

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Peeler Lake
Hoover Wilderness
Humboldt Toiyabe N.F.

9,500 ft. elevation on NE border of Yosemite National Park
A ten foot long section of trail edge had fallen into the lake

Scary footing for a horse And a 21 ft. drop to the water!

Trail tread should be out here
Looking down toward the water:
A 2,200 lb. rock is perched on a tree trunk
Looking up from the lake:

Loose rubble rock is balanced on bedrock. Nothing is anchored and there is no place for a footing.

The trail had been constructed with heavy use of explosives. The blasted material was stacked and smoothed to make a tread – until gravity had its way.
First we placed a log on the edge of the trail to preserve the tread while we worked. We needed to keep the trail open and passable.
This temporary trail fix looked pretty good from above.
But still pretty scary

from below
We scaled loose rock from the area so we could work safely at the bottom.
We really needed to move the big rock that was balanced on the tree trunk.

It was 13 cubic ft. That’s 2,200 lbs. !
We beat on it

And pushed on it
We set an anchor

and pulled on it

And moved it!
Then we went back to camp to figure out what to do next
The Virginia Lakes Pack Outfit had brought in our five loads of gear
We set up a camp that was simple.
yet elegant
We figured out what to do next:

With a crew of 15, some explosives, rock drill, and rock cutting tools, we could build a 210 sq. ft. dry masonry wall footed at lake level. This would take approximately 3 weeks and would require closing the trail and part of the lakeshore. We had the skill and experience to do this type of work. In fact, this type of rockwork is my specialty.

However, a very important specialty in Wilderness trail work is the ability to figure out how to solve a problem with the minimum tool.

We needed to design a solution that 4 of us could build in 4 more work days, using traditional skills and tools, while keeping the trail open and passable.
We were a crew of four Rock Stars with four days to work

Dolly Chapman

Shannon Hoyt

Tyler Hill

John Glenn
We chose to build with logs

We would use dead and down logs near the lakeshore. The slow growing lodgepole and whitebark pine would last for decades at this elevation.
We looked all around the lake for dead and downed logs

Then we sawed

And wrestled
And limbed

And hoisted
And used log tongs to drag logs to the lake
And we threw logs into the lake

We had 12 logs, ranging up to 16 ft. long and 730 lbs.

We certainly couldn’t carry them to the project site
We towed them with an inflatable boat!
Boat-loads of fun!
And hard work, too!
We landed our logs on a beach near the worksite.
The hookeroon was the perfect tool for managing logs at the shore.
Rare modern instances of a hookeroon in use
It took a lot of work:

- Rigging
- Notching
- Hoisting
- Placing

to assemble our beached logs into a strong wall
Cross section view of the wall design:

We built on top of two 10’ tall x 17” diameter pillars because there was good footing space for pillars, but not for whole wall stringers or deadman logs.

The weight of the trail tread holds the deadman logs in place.

The angle of the deadman logs and the notches hold the stringer logs in place.
John was our master rigger
In addition to the griphoist, he brought a 7:1 block and tackle.
The blue rope, of Dyneema® fiber, is 3 times stronger than wire rope of the same diameter --- and 7 times lighter!
Even with the rigging, we needed pry bars and muscle to get the logs up the wall.
Good notches were critical to the strength of the structure
The first stringer was notched to fit over the pillars

The deadman logs and stringers were notched together
We marked the notches using a plumb bob, square and tape measure.

We cut kerfs with the saw and shaped the notches with an adze.

(Keeping toes raised out of the way!)
We did most of the notching on shore before we hoisted the logs.
Notches in the deadman logs will hold the next stringer

well placed rocks help hold the log structure in place
Large rocks fill the gaps between the stringers
We had to undermine the trail to place the deadman logs.

We filled the log cribbing with rock as we worked.
The finished wall includes 175 cubic ft. of rock fill. That’s 8 tons!
Full view of the finished wall:

We spared
the tree growing
out of the rocks
between the log pillars
The finished wall is very sturdy
The finished trail is wide and safe
The finished trail crew is very happy
The Crew: Crewman Tyler Hill and I were joined by two highly qualified volunteers: Shannon Hoyt, my husband, a seven year veteran of USFS trail crews and currently an electrical lineman; and John Glenn, rigging and sawing specialist and great friend who volunteers full time on the Sierra NF. John brought a full complement of rigging gear including griphoist, and rope made of Dyneema® fiber in lieu of heavy wire rope. Each crew member offered special skills and abilities that made this project possible.

The Work: We worked at Peeler Lake on the trail that provides primary access to Yosemite National Park in the Hoover Wilderness. A 10' long section of trail edge alongside Peeler Lake had collapsed, leaving a narrow and unstable tread between cliffs and the 21' drop to lake level. This section of trail was hazardous for stock and was likely to give way completely and close the trail. We used 12 large logs, up to 730 lbs. in weight to build a 70 sq. ft. cribbed wall supported on 10' log pillars. We backfilled the log cribbing with 175 cu. ft. (8 tons) of rock to create a wide stable tread. The logs in the crib wall were cabin notched to ‘deadman’ logs that extended under the tread to tie the structure into the trail. We cut the ‘dead and down’ logs with a crosscut saw and used a block and tackle and log tongs to take them to waters edge. We towed them across the lake with an inflatable boat and dragged them to shore with a hookeroon. We used a plumb bob, square and chalk line to mark the notches and a saw and adze to shape them. We used a griphoist, block and tackle and rockbars to hoist the logs into place and used tote bags to haul and sledgehammers to crush the rock backfill. In keeping with the Wilderness Act, we used no motorized equipment or non-native materials for the project.

Safety: We reviewed and signed JHA’s specific to this project. We prepared an emergency response plan. We documented daily safety discussions on topics relating to this project. Before beginning construction we spent a days time shoring up the trail with a temporary log rail and scaling large rocks (up to 2,200lbs.) from the project area so that the public could pass and we could work safely. This type of attention to safety is time consuming but well worth the effort. Having a small and highly skilled crew was the best way to accomplish this work safely.

Logistics and Other Notes: The Virginia Lakes Pack Outfit donated their services to pack our equipment in and out. They used 5 mules each way. We set up our camp ½ mile below Peeler Lake so as to leave the prime lakeside campsites for the public.