

Mules add power to Bob Marshall bridge construction project

By KARL PUCKETT Great Falls Tribune Nov 19, 2011



A pack of mules crosses the newly completed 128-foot-long Gates Park Pack Bridge spanning the North Fork of the Sun River in the Bob Marshall Wilderness.

U.S. Forest Service

GREAT FALLS - Old-fashioned mule power and new construction techniques and tools were used to reconstruct the 128-foot-long Gates Park Pack Bridge spanning the North Fork of the Sun River in the Bob Marshall Wilderness.

The combination eliminated the need for heavy-lifting equipment on site - and helicopters to get it there.

U.S. Forest Service officials said the project is an example of how bridges in quiet backcountry areas can be successfully rehabilitated with less noise and a lighter construction footprint when compared with traditional methods.

"We're pretty excited about it," said Alex Gavrisheff, operations staff

officer with the Helena and Lewis and Clark national forests. "It's never been done before."

The Forest Service previously rehabilitated bridges in the backcountry, but the Gates Park bridge in the Lewis and Clark National Forest is the first to be overhauled without using heavy-lifting equipment and helicopters, Gavrisheff said.

He came up with the concept of overhauling the bridge using a new assembly technique dubbed "one-piece-at-a-time."

It involved using a light-weight portable jacking system - instead of a large system weighing 500 pounds - and assembling bolt-laminated timbers on site.

Mule trains - 198 mule loads in all - were used to get materials and tools to the site, with the Forest Service returning to its early mode of backcountry transportation to accomplish the new assembly plan.

"Here we are in the 21st century, and yet we're using 18th century techniques to accomplish this work," Gavrisheff said.

The first string of backcountry horsemen and pack mules crossed the newly completed bridge Aug. 16.

Hunters and hikers use the bridge to cross the North Fork of the Sun River 30 miles northwest of Augusta to reach hunting areas or the popular Chinese Wall.

The bridge - the oldest suspension bridge in the forest - was rated a 4 out of 9 in an annual inspection in 2004.

Gavrisheff now is sharing the one-piece-at-a-time idea nationally.

On Oct. 25, Gavrisheff and Karl Yakawich of Great West Engineering in Helena presented the technique to the annual meeting of the Association of Conservation Engineers in St. Louis.

The Forest Service hired Great West to do the engineering work for the project, and Yakawich modified Gavrisheff's original idea, as did Rich May Construction, the California-based company hired to rebuild the bridge.

Dave Cunningham, a spokesman for the Lewis and Clark National Forest, said the Forest Service could have applied for a waiver to use helicopters, which normally are banned in the wilderness. But the one-piece-at-a-time approach, eliminates the impact of repeated helicopter trips to haul materials into remote areas of forest, he said.

"From Arizona to Alaska, it's a technique that can be replicated," Cunningham said.

There are 28 suspension trail bridges in national forests in Region 1, which includes Montana, northern Idaho and the Dakotas, including 12 such bridges in areas designated wilderness.

The one-piece-at-a-time approach already is being replicated for the Medicine Springs Bridge, which also is located in the Lewis and Clark National Forest. Survey and design work on that project began last month.

The Gates Park contract design criteria required that bridge materials or construction tools be no longer than 8 feet or they could weigh no more than 100 pounds.

"What we have is pieces that can be carried by a pack mule,"

Gavrisheff said.

The materials first were transported 7 miles by barge to the head of Gibson Reservoir.

Then the mules took over, transporting the items the remaining 12 miles to the site.

A four-man crew began construction July 15.

Typically, helicopters haul in a 500-pound jack and cranes to jack up the bridge in order to replace old towers on each end of the structure. Cranes also would be needed to move the heavy equipment on the site.

Gavrisheff said the job proved that a bridge could be rehabilitated using a portable lightweight jack packed in pieces into a site.

"We invented a way of doing it," he said.

There were other options for rehabilitating the old bridge.

Helicopters could have hauled in a prefabricated steel bridge, or a new timber bridge and a heavy jacking system.

When Gavrisheff first came up with the one-piece-at-a-time idea in 2008, he sketched it out and presented it to Region 1's top engineer, who gave the OK to the concept.

The contract criteria emphasized performance and innovation, not the lowest bid, he said.

The transportation of materials and equipment accounted for \$55,000 of the total budget of \$156,200. The transportation costs

would have been similar - or more - had helicopters been used instead of mules, Gavrisheff said.



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